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# Stockpile Report to the Congress

April — September 1986

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FEDERAL EMERGENCY  
MANAGEMENT AGENCY



# Federal Emergency Management Agency

Washington, D.C. 20472

May 1987

The Honorable George Bush  
President of the Senate

The Honorable James C. Wright, Jr.  
Speaker of the House of Representatives

Sirs:

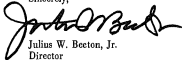
This Stockpile Report to the Congress is submitted in accordance with Section 11 of the Strategic and Critical Materials Stock Piling Act, as amended.

The Stock Piling Act provides that strategic and critical materials be stockpiled in the interest of national defense to preclude a dangerous and costly dependence upon foreign sources of supply in times of national emergency and establishes the National Defense Stockpile for that purpose.

By Executive Order 12155, the President delegated to the Director of the Federal Emergency Management Agency the policy implementation and planning activities for the National Defense Stockpile under the Stock Piling Act.

This report covers operations of the National Defense Stockpile during the April 1986-September 1986 period.

Sincerely,



Julius W. Becton, Jr.  
Director

# PREFACE

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Consistent with past practice, this report covers the operations of the National Defense Stockpile for the period April 1 through September 30, 1986. However, significant changes in the statutory basis of the program occurred immediately after the close of the report period.

Public Law 99-591, Continuing Appropriations for Fiscal Year 1987, was enacted on October 30, 1986, and provided, *inter alia*, that no later than October 1, 1988, all funds authorized and appropriated before January 1, 1985, from the National Defense Stockpile Transaction Fund were to be obligated to evaluate, test, relocate, upgrade or purchase stockpile materials to meet National Defense Stockpile goals in effect on October 1, 1984.

On November 14, 1986, the National Defense Authorization Act of 1987 (P.L. 99-661) was enacted, which has the following principal effects on the operations of the National Defense Stockpile:

- The prohibition on reductions in stockpile goals was extended to October 1, 1987.
- Additional quantities of stockpile materials were authorized for disposal
- The limitation on disposals imposed by Section 5(b)(2) of the Strategic and Critical Materials Stock Piling Act was waived for Fiscal Year 1987, provided the moneys received from disposals do not exceed the amount obligated from the Fund during the fiscal year for purposes authorized under Section 9(b)(2) of the Stock Piling Act.
- The continuation of the President's ferroalloy upgrading program was mandated for 7 years with minimum annual quantities of chromite and manganese ores to be upgraded to high carbon ferrochromium and high carbon ferromanganese, respectively.
- The Secretary of Defense was required to submit to the Congress a report describing, *inter alia*, the war emergency situation that should serve as the basis for planning and management of the National Defense Stockpile.

In addition, P.L. 99-661 effected the following amendments to the Strategic and Critical Materials Stock Piling Act:

- A new Section 6A was added to the Stock Piling Act requiring that the President, by February 15, 1987, designate a single Federal official to be the National Defense Stockpile Manager to perform the functions of the President under the Stock Piling Act.
- Eligible expenses for funding from the Transaction Fund under Section 9(b) of the Stock Piling Act were extended to certain activities incident to the operations of the Stockpile.

On February 13, 1987, the President, in compliance with Section 6A of the Stock Piling Act, designated Julius W. Becton, Jr., Director of the Federal Emergency Management Agency, to be the National Defense Stockpile Manager.

A reference copy of the Strategic and Critical Materials Stock Piling Act as amended by the National Defense Authorization Act of 1987 is included in this report as Appendix 8.

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# INTRODUCTION

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This report is prepared in accordance with Section 11 of the Strategic and Critical Materials Stock Piling Act (P.L. 96-41, 50 U.S.C. 98 *et seq.*), and covers stockpile program activities under the Stock Piling Act occurring during the period from April 1, 1986, through September 30, 1986. The organization of the report is designed to present the information required to be reported by the Act, which includes:

- (1) information with respect to foreign and domestic purchases of materials during the preceding 6-month period;
- (2) information with respect to the acquisition and disposal of materials by barter pursuant to Section 6(c) of the Act, during such period;
- (3) a statement and explanation of the financial status of the National Defense Stockpile Transaction Fund and the anticipated appropriations to be made from the Fund during the next fiscal year; and
- (4) such other pertinent information on the administration of the Stock Piling Act as will enable the Congress to evaluate the effectiveness of the program provided for under the Act and to determine the need for additional legislation.

Consistent with these statutory requirements, this report is divided into four major sections:

- I. Stockpile Acquisition and Disposal Program;
- II. Stockpile Barter Program;
- III. Financial Status of the National Defense Stockpile Transaction Fund; and
- IV. Administration of the Stockpile Program.

Appendix materials provide:

- Detailed information on the current inventory of materials in the National Defense Stockpile, with a key to abbreviations used in quantity measures and an explanation of calculation procedures; and

*Strategic and Critical Materials Stock Piling Act and Executive report period, the White House Press Release on the with related materials, the Fiscal Year 1987 Annual version of the Strategic and Critical Materials Stock -661.*

# HIGHLIGHTS

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## I. STOCKPILE ACQUISITION AND DISPOSAL PROGRAM

- There were no acquisitions of stockpile materials funded from the National Defense Stockpile Transaction Fund during the report period. Jewel bearings valued at \$502,000 were acquired for the Stockpile under separate appropriation.
- Under the ferroalloy upgrading program, a total of 22,844 short tons of ferrochromium and 19,435 short tons of ferromanganese have been received back into inventory as upgraded material during the report period.
- Disposals of three excess stockpile materials with a total value of \$18.4 million were transferred in payment for services under the ferroalloy upgrading program during the report period.
- Silver valued at \$13.3 million was transferred from the Stockpile inventory to the Department of the Treasury for coinage.

## II. STOCKPILE BARTER PROGRAM

- There were no new barter agreements negotiated during the report period.

## III. FINANCIAL STATUS OF THE NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

- Total receipts of \$1020.8 million have been credited to the National Defense Stockpile Transaction Fund since its inception in 1979.
- Congress has approved a cumulative total of \$602.3 million from the Transaction Fund for the purchase of materials for the Stockpile and for the research grants program.
- The balance in the Transaction Fund, as of September 30, 1986, was \$598.7 million. Of this amount, previously provided obligational authority of \$215.4 million remained for purchases of materials for the Stockpile.

## IV. ADMINISTRATION OF THE STOCKPILE PROGRAM

- The inventory in the Stockpile as of September 30, 1986, had a value of \$8.3 billion.
- In August 1986, the General Accounting Office issued a briefing report on "National Defense Stockpile: Adequacy of National Security Council Study for Setting Stockpile Goals." The National Security Council responded with a rebuttal.
- Several bills were considered by both the Senate and House of Representatives containing provisions affecting the operations and management of the National Defense Stockpile.



# I. STOCKPILE ACQUISITION AND DISPOSAL PROGRAM

## Acquisitions of Goal Materials

No purchases of goal materials were funded from the National Defense Stockpile Transaction Fund during the report period. There were no acquisitions of new materials by barter or exchange. As shown in Figure 1, the only acquisitions of materials during the report period were under the ferroalloy upgrading and jewel bearing programs. The cost of jewel bearings acquired for the Stockpile from

the U.S. Government-owned William Langer Jewel Bearing Plant located at Rolla, North Dakota, is not included in Transaction Fund accounts because the bearings are funded under a separate program appropriation. During the report period, 358,886 jewel bearings were ordered for the Stockpile at an estimated cost of \$502,000.

Figure 1  
Acquisitions of Stockpile Materials  
April 1, 1986-September 30, 1986

Material	Unit	Quantity	Value
Purchases of New Material		-0-	\$ -0-
Total Obligations from Transaction Fund			\$ -0-
Acquisition by Barter		-0-	\$ -0-
Total Value of Barter Transactions			\$ -0-
Ferroalloy Upgrading Program			
Ferrochromium, High Carbon	ST	22,844	\$ 11,376,137
Ferromanganese, High Carbon	ST	19,435	\$ 8,712,997
Total Value of Deliveries of Upgraded Material			\$ 20,089,134
Other			
Jewel Bearings	PC	358,886	\$ 502,000
Total Value of Jewel Bearings Deliveries			\$ 502,000

## Ferroalloy Upgrading Program

In accordance with President Reagan's directive in November of 1982, the General Services Administration (GSA) is in its third year of upgrading chromite ore and manganese ore to high carbon ferrochromium and high carbon ferromanganese, respectively. This project was initiated to help sustain a U.S. ferroalloy furnace and processing capability vital to the national defense and security. The continued operation of this capacity will reduce the time needed for conversion of stockpile materials into ferroalloys in time of an emergency.

Contracts covering calendar year 1986 were signed on October 4, 1985, with Macalloy Corporation of Charleston, South Carolina, and Elkem Metals Company of Pittsburgh, Pennsylvania, for the third year of upgrading chromite and manganese ores, respectively. Direct costs for 1986 will total approximately \$30 million. Payments to the contractors have been made using excess stockpile materials currently authorized for disposal.

The GSA reports that program accomplishments for the calendar year 1986 contracts from April 1, 1986, through September 30, 1986, include the outloading, sampling, and upgrading of 31,055 short tons out of the contract total of 94,028 short tons of chromite ore; and 14,902 short tons of manganese ore out of the contract total of 59,263 short tons. Deliveries during this same report period consisted of 22,844 short tons of ferrochromium, out of a total 35,211 short tons (which complete this contract) and 19,435 short tons of ferromanganese, bringing that total to 27,516 short tons out of an estimated 33,851 short tons (or 81 percent complete).

The totals to date for the first three calendar years of the ferroalloy upgrading program, through September 30, 1986, consist of the outloading and conversion of 356,671 short tons of chromite ore and the subsequent delivery of 134,867 short tons

of ferrochromium; and the outloading and conversion of 195,543 short tons of manganese ore and the delivery of 98,389 short tons of ferromanganese. There will be an additional 6,585 short tons of ferromanganese to be delivered to complete the 1986 contract. The total ferroalloy upgrading cost for the three years (1983-1986) is nearly \$107 million.

## Disposals of Excess Inventory

On October 1, 1985, the General Services Administration (GSA) suspended the offering for sale of excess inventories of strategic and critical materials from the National Defense Stockpile. This action was taken to comply with the restriction in Section 5(b) of the Strategic and Critical Materials Stock Piling Act, which prohibits such sales when the balance in the National Defense Stockpile Transaction Fund exceeds \$250 million. At the close of business on September 30, 1985, this statutory limitation had been exceeded. Unless this restriction is revised by the Congress or the unobligated balance in the Transaction Fund totals less than \$250 million (or \$100 million after September 30, 1987), disposals for cash of excess stockpile materials will continue to be halted. (See "Preface" for subsequent change.)

Disposals of excess stockpile materials are permitted under Section 6(c)(2) of the Stock Piling Act when used as payment material for upgrading existing inventories of stockpile materials. Under this authority disposals of three excess stockpile materials totaling \$18.4 million in value were made during the report period in support of the ferroalloy upgrading program. These disposals involved antimony, tin, and vegetable tannin (quebracho).

As detailed in Figure 2, disposals of excess stockpile materials totaled \$31.7 million in value during the report period. Of this value, \$13.3 million represented transfers of silver to the Department of the Treasury for use in minting Liberty coins.

**Figure 2**  
**Disposals of Excess National Defense Stockpile Materials**  
**April 1, 1986-September 30, 1986**

Material	Unit	Value	Quantity	Balance of Disposal Authority (Quantity) <sup>a</sup>
<b>Transfers for Ferroalloy Upgrading Program Expenses <sup>b</sup></b>				
Antimony	ST		N/A	N/A
Tin	MT	\$18,447,266	N/A	N/A
Vegetable Tannin, Quebracho	LT		N/A	N/A
<b>Transfers to Treasury Department</b>				
Silver	TR OZ	13,297,259	3,500,000	10,000,000 <sup>c</sup>
<b>Cash Sales</b>				
Antimony	ST	-0-	-0-	1,783 <sup>b</sup>
Asbestos, Chrysotile	ST	-0-	-0-	5,600
Diamond, Industrial, Stones	KT	-0-	-0-	4,502,630
Manganese Dioxide, Battery Grade, Natural Ore	SDT	-0-	-0-	47,210
Manganese Ore, Metallurgical Grade	SDT	-0-	-0-	292,000
Mica, Muscovite Flm 1st & 2nd Qualities	LB	-0-	-0-	997,500
Silver	TR OZ	-0-	-0-	10,000,000 <sup>c</sup>
Talc, Steatite Block & Lump	ST	-0-	-0-	63
Thorium Nitrate	LB	-0-	-0-	40,000
Tin	MT	-0-	-0-	11,789 <sup>b</sup>
Tungsten Ores & Concentrates	LB W	-0-	-0-	720,357
Vegetable Tannin Extract, Chestnut	LT	-0-	-0-	3,306
Vegetable Tannin Extract, Quebracho	LT	-0-	-0-	16,461 <sup>b</sup>
<b>Total Value of Disposals</b>		<b>\$31,744,545</b>		

<sup>a</sup> Does not include additional disposal authority enacted in P.L. 99-661 after the report period.

<sup>b</sup> Individual material detail for transfers under the ferroalloy upgrading program have not been reported separately by the General Services Administration since January 1966. The balances of disposal authority reported under cash sales include reductions for transfers for the upgrading program.

<sup>c</sup> Under Public Law 96-61, transfers of silver for minting Liberty coins are not subject to the limitations on disposals under Sections 5(b) and 6(a)(5) of the Strategic and Critical Materials Stock Piling Act.

## Status of the Stockpile Inventory

In Figure 3, the composition of the National Defense Stockpile inventory, as of September 30, 1986, is summarized in terms of family group equivalents. The value of the inventory for each family group is stated in terms of market prices as of September 29, 1986, of the constituent materials included in the family group in their present form. Details on the quantities of all materials in the stockpile inventory and the calculation procedure for conversion to family group equivalents are provided in Appendixes 1 and 2. Some inven-

tories may vary from the previous report period due to inventory adjustments by the General Services Administration. Disposals of Defense Production Act inventories are reflected in the overall inventory totals, while receipts are not covered into the Transaction Fund account.

Rank orderings by value, as of September 30, 1986, of the family groups of stockpile materials for which there is inventory excess to current goals or for which there is a shortfall in inventory to meet the goals are presented in Figures 4 and 5.

Figure 3  
Summary Status of the National Defense Stockpile Inventory of Strategic and Critical Materials  
September 30, 1986

Material	Unit	Goal	Inventory		Inventory Quantity	
			Quantity	Value (Millions)	Excess	Deficit
1. Aluminum Metal Group	ST Al Metal	7,150,000	4,278,912	\$ 826.8		*2,871,090
2. Aluminum Oxide, Abrasive Grain Group	ST Ab Grain	638,000	259,124	128.6		*378,876
3. Antimony	ST	36,000	37,420	102.9	1,420	
4. Asbestos, Amosite	ST	17,000	34,011	23.8	17,011	
5. Asbestos, Chrysotile	ST	3,000	10,705	19.5	7,705	
6. Bauxite, Refractory	LCT	1,400,000	274,229	63.9		1,125,771
7. Beryllium Metal Group	ST Be Metal	1,220	1,089	223.1		+131
8. Bismuth	LB	2,200,000	2,081,298	5.8		118,702
9. Cadmium	LB	11,700,000	5,328,809	6.8		5,371,191
10. Chromium, Chem. & Metallurgical Group	ST Cr Metal	1,353,000	1,309,888	1146.2		*43,312
11. Chromium, Refractory Grade Ore	SOT	850,000	391,414	39.1		458,586
12. Cobalt	LB Co	85,400,000	53,109,188	345.2		32,290,812
13. Columbium Group	LB Co Metal	4,850,000	2,713,469	14.0		*2,136,531
14. Copper	ST	1,000,000	29,048	44.1		970,952
15. Cordage Fibers, Abaca	LB	155,000,000	0	-		155,000,000
16. Cordage Fibers, Sisal	LB	60,000,000	0	-		60,000,000
17. Diamond, Industrial Group	KT	29,700,000	33,063,636	354.2	3,363,636	
18. Fluorspar, Acid Grade	SOT	1,400,000	895,983	155.0		504,017
19. Fluorspar, Metallurgical Grade	SOT	1,700,000	411,738	51.5		1,288,262
20. Germanium	KG	30,000	0	-		30,000
21. Graphite, Natural, Ceylon.	ST	6,300	5,497	10.7		803
22. Graphite, Natural, Malagasy, Amorphous Lump	ST	20,000	17,838	53.5		2,162
23. Graphite, Natural, Other than Ceylon & Malagasy	ST	2,800	2,803	2.0		3
24. Iodine	LB	5,800,000	7,369,781	46.8	1,569,781	
25. Jewel Bearings	PC	120,000,000	74,665,118	84.3		45,344,882
26. Lead	ST	1,100,000	601,018	264.4		498,982
27. Manganese, Bat. Grade Group	SOT	87,000	208,165	19.2	*121,165	
28. Manganese, Chem. & Metallurgical Group	ST Mn Metal	1,500,000	1,942,475	502.5	*442,475	
29. Mercury	FL	10,500	1,169,226	30.0	155,726	
30. Mica, Muscovite Block, Stained & Better	LB	6,200,000	5,212,361	27.8		987,639

Figure 3 (continued)

Material	Unit	Goal	Inventory		Inventory	
			Quantity	Value (Millions)	Excess	Deficit
31. Mica, Muscovite Film, 1st & 2nd Qualities	LB	90,000	1,178,755	\$ 13.8	1,089,755	
32. Mica, Muscovite Splittings	LB	12,630,000	14,652,181	22.0	2,022,181	
33. Mica, Phlogopite Block	LB	210,000	130,745	.7		79,255
34. Mica, Phlogopite Splittings	LB	930,000	1,518,951	3.0	588,951	
35. Molybdenum Group	LB Mo	0	0	-	-	
36. Morphine Sulphate and Related Analgesics	ANA LB	130,000	71,303	24.2		*58,697
37. Natural Insulation Fibers	LB	1,500,000	0	-		1,500,000
38. Nickel	ST Ni+Co	200,000	37,222	137.2		162,778
39. Platinum Group Metals, Iridium	Tr Oz	98,000	29,590	12.4		68,410
40. Platinum Group Metals, Palladium	Tr Oz	3,000,000	1,254,602	177.4		1,735,398
41. Platinum Group Metals, Platinum	Tr Oz	1,310,000	452,641	269.8		857,359
42. Pyrethrum	LB	500,000	0	-		500,000
43. Quartz Crystals	LB	600,000	1,846,532	11.1	1,248,532	
44. Quinidine	Av Oz	10,100,000	2,473,109	10.4		7,626,891
45. Quinine	Av Oz	4,500,000	3,246,164	7.8		1,253,836
46. Ricinoleic/Sebacic Acid Products	LB	22,000,000	12,524,242	9.7		*9,475,758
47. Rubber	MT	864,000	127,446	126.2		736,554
48. Rutile	SOT	106,000	39,186	12.9		66,814
49. Sapphire and Ruby	KT	0	16,305,502	.2	16,305,502	
50. Silicon Carbide, Crude	ST	29,000	80,550	36.2	51,550	
51. Silver, Fine	Tr Oz	0	130,005,707	730.5	130,005,707	
52. Talc, Steatite Block & Lump	ST	28	1,081	.4	1,053	
53. Tantalum Group	LB Ta Metal	7,160,000	2,642,073	92.7		*4,517,927
54. Thorium Nitrate	LB	600,000	7,121,812	19.5	6,521,812	
55. Tin	MT	42,700	180,889	1,024.5	138,189	
56. Titanium Sponge	ST	195,000	36,831	278.0		158,169
57. Tungsten Group	LB W Metal	50,666,000	74,048,291	260.1	*23,382,291	
58. Vanadium Group	ST V Metal	8,700	721	8.6		*7,979
59. Vegetable Tannin Extract, Chestnut	LT	5,000	12,746	8.6	7,746	
60. Vegetable Tannin Extract, Quebracho	LT	28,000	126,618	87.0	98,618	
61. Vegetable Tannin Extract, Wattle	LT	15,000	15,001	10.6		
62. Zinc	ST	1,425,000	378,316	347.3	1	1,046,684
TOTAL VALUE OF INVENTORY				\$8,334.5		

\*Denotes the equivalent total excess or deficit if all of the constituent forms in the family group are converted to the family group equivalent.

Figure 4

Excesses in Inventory  
of Stockpile Materials  
as of September 30, 1986

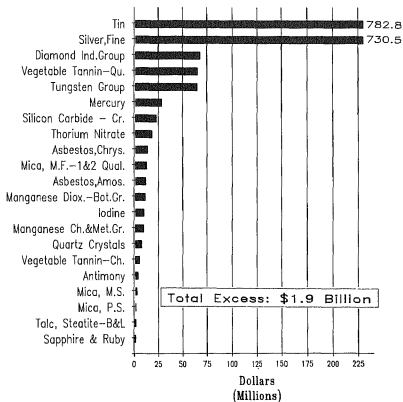
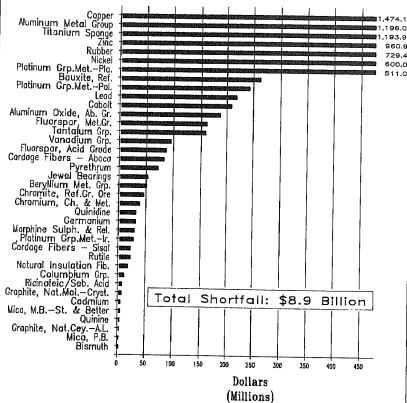


Figure 5

# Shortfalls in Inventory of Stockpile Materials as of September 30, 1986



## II. STOCKPILE BARTER PROGRAM

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The acquisition of strategic and critical materials for the Stockpile by the General Services Administration from the Commodity Credit Corporation (CCC) has been on a case-by-case basis, with the question of reimbursement handled as a part of the normal budget process. Administration policy is that the CCC must be reimbursed at the value of the bartered agricultural commodities when transfers of bartered materials are made to the Stockpile.

The U.S. policy on barter continues to be as stated in the President's National Materials and Minerals Program Plan and Report to Congress, dated April 5, 1982:

The Administration will rely primarily upon purchases on the open market to build the nation's stockpile...We will use exchanges and barter to acquire additional stockpile materials when in the best interests of the country.

On February 8, 1985, the President's Report to Congress pursuant to Section 904 of Public Law 98-525 reiterated that policy and clarified that barter and exchange would be used to acquire stockpile materials "in cases where it is more efficient and effective than open market transactions or when in the best interest of the country."

There were no new barter agreements negotiated during the report period.

Pursuant to Public Law 99-198, the Food Security Act of 1985, the Department of Agriculture is in the process of identifying potential foreign suppliers of strategic and critical materials for a pilot barter program. The pilot program will be carried out through agreements with at least two countries and will include materials not produced in the United States in amounts sufficient for domestic requirements and for which there are shortfalls in goals established by law for the National Defense Stockpile. Public Law 99-198 states that, to the extent practical, the Secretary of Agriculture is to use private channels of commerce to consummate any exchange of commodities for materials under this pilot program. Any material acquired, in excess of any required reserve, may be sold by the Commodity Credit Corporation to the extent authorized by the Secretary of Agriculture—taking into consideration any effect that such sale may have on the commercial market of such material. The acquired materials may also be transferred, on a reimbursable basis, to any department or agency of the United States that has responsibility for any reserve or other need for the material. The Secretary of Agriculture is to submit a report to Congress with respect to the operation of the pilot program.



### III. FINANCIAL STATUS OF THE NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

All proceeds from the sale of stockpile materials, transfers from the naval petroleum reserves (in Fiscal Years 1985 and 1986), and specified direct appropriations, are placed in the National Defense Stockpile Transaction Fund established under Section 9 of the Strategic and Critical Materials Stock Piling Act.

As reported by the General Services Administration, the disposal sales of excess materials from inception of the Fund in Fiscal Year 1979 through September 30, 1986, have a total value of \$463.1 million, as detailed in Figure 6. Information on the other sources for the Transaction Fund is provided in Figure 8.

Figure 6  
Cumulative Disposal Sales Commitments of Excess Stockpile Materials  
July 30, 1979-September 30, 1986

Material	Unit	Quantity	Value
Antimony	ST	2,861	\$ 5,313,623
Asbestos, Chrysotile	ST	1,000	1,493,830
Celestite	SDT	1,000	1,000
Diamond, Industrial, Crushing Bort	KT	2,375,123	5,196,183
Diamond, Industrial, Stones	KT	6,711,554	81,128,723
Kyanite	SDT	300	30,000
Iodine	LB	640,668	3,562,889
Magnesium	ST	382	763,820
Manganese Dioxide, Battery Grade, Natural Ore	SDT	56,159	4,231,925
Manganese Ore, Chemical Grade	SDT	49,238	3,991,966
Mercuric Oxide	LB	643,175	1,917,648
Mercury	FL	17,172	5,614,575
Mica, Muscovite Film, 1st & 2nd Quality	LB	102,326	347,616
Mica, Muscovite Splittings	LB	6,941,036	4,580,637
Mica, Phlogopite Splittings	LB	1,299,555	1,189,322
Quartz Crystals	LB	613,553	1,906,033
Rare Earth Oxides	SDT	702	533,000
Rubber	LT	646	469,343
Silver	TR OZ	8,000,000	43,536,053
Talc, Steatite Block & Lump	ST	10	4,000
Thorium Nitrate	LB	36,875	88,699
Tin	MT	14,184	200,791,321
Tungsten Ores & Concentrates	LB W	11,568,460	77,920,117
Vegetable Tannin Extract, Chestnut	LT	4,865	3,210,162
Vegetable Tannin Extract, Quebracho	LT	22,431	14,302,049
Vegetable Tannin Extract, Wattle	LT	1,350	940,749
Total Sales Since July 30, 1979			\$463,067,023

As reported by the General Services Administration, a total of \$367.7 million has been obligated from the National Defense Stockpile Transaction Fund from the inception of the Fund through September 30, 1986, to finance the purchase of needed stockpile materials from numerous world

sources. The cumulative data by material acquired are shown in Figure 7. In addition, \$9.3 million were obligated during the report period under the research grants program, bringing that program total to \$18.8 million.

Figure 7  
Cumulative Obligations from the National Defense Stockpile Transaction Fund  
July 30, 1979-September 30, 1986

Material	Unit	Quantity	Cost	Origin
Bauxite, Metallurgical Grade	LOT	3,600,000	\$122,484,419	Jamaica
Bauxite, Refractory	LCT	100,327	14,923,273	China
Beryllium	LB	120,000	28,441,160	Domestic
Cobalt	LB	12,200,000	110,542,459	Various <sup>a</sup>
Iridium	TR OZ	12,600	4,676,897	South Africa
Nickel	ST	5,000	24,263,891	Canada, Norway
Palladium	TR OZ	9,600	1,322,741	South Africa
Quinidine	AV OZ	671,983	2,520,411	Netherlands
Rubber	LT	8,890	7,019,666	Various <sup>b</sup>
Tantalum Minerals	LB TA	262,883	11,548,032	Various <sup>c</sup>
Titanium Sponge	ST	4,500	29,327,317	Various <sup>d</sup>
Vanadium	ST V	181	1,678,114	Domestic
Total Obligations for Materials			\$367,749,380	
Obligations for Research Grants			18,802,185	
Total Obligations			\$386,551,565	

<sup>a</sup> Canada, Zaire, and Zambia.

<sup>b</sup> Malaysia, Indonesia, and Thailand.

<sup>c</sup> Brazil, Australia, Germany, Thailand, the Netherlands, Zaire, Mozambique, Nigeria, Malaysia, Canada, Rwanda, Zimbabwe, South Africa, Namibia, Singapore, Spain, Portugal, China, and Argentina.

<sup>d</sup> Japan, United Kingdom, and the United States.

The financial status of the National Defense Stockpile Transaction Fund from its inception is summarized in Figure 8. As of September 30, 1986, total net resources available to the Fund for acquisitions and grants were \$985.2 million. Of this amount, Congress has approved the use of \$602.3 million to purchase needed stockpile materials from numerous domestic and foreign sources and for research grants to the University of Massachusetts at Amherst and the University of Nevada at Reno. The total unobligated balance in the Fund as of September 30, 1986, is \$598.7 million, of which \$215.4 million has been made available by Congress for expenditures. An additional \$383.3 million is in the Fund but not available for obligation.

Beginning in Fiscal Year 1985, receipts from earnings from the naval petroleum reserves were transferred to the Transaction Fund pursuant to Public Laws 98-525 and 99-145. Receipts to date are as follows:

Fiscal Year 1985 - \$	96.1
-	201.3
Fiscal Year 1986 -	116.9
-	62.8
	<hr/>
	\$477.1

Pursuant to Public Law 99-177, \$35.6 million were sequestered as reflected in Figure 8 and the unobligated balance.

Sales of excess materials prior to July 30, 1979, for which the proceeds of \$44.7 million were received after that date, and adjustments due to over- and under-shipments of disposal contracts, account for the difference between total disposal sales of excess stockpile materials and total receipts from such disposals.

Figure 8  
Financial Status of the National Defense Stockpile Transaction Fund  
July 30, 1979-September 30, 1986  
(Millions of Dollars)

Period	Receipts/ Budget Authority	Obligational/ Budget Authority	Net Obligations	Unobligated Balance in Fund (End Date)
August 1, 1979 to September 30, 1979	\$ 7.3	0	0	\$ 7.3
October 1, 1979 to September 30, 1980	87.0	0	0	94.3
October 1, 1980 to September 30, 1981	99.2	\$100.4	\$ 78.0	115.5
October 1, 1981 to September 30, 1982	161.0	57.9	44.0	232.5
October 1, 1982 to September 30, 1983	53.2	120.0	145.0	140.7
October 1, 1983 to September 30, 1984	51.0	120.0	91.5	100.2
October 1, 1984 to September 30, 1985	343.0	185.0	9.0	434.2
October 1, 1985 to March 31, 1986	142.8	18.0 <sup>a</sup>	9.8 <sup>b</sup>	567.2
April 1, 1986 to September 30, 1986	76.3 <sup>c</sup>	0	9.2 <sup>d</sup>	598.7 <sup>a</sup>
Totals	\$1020.5 <sup>f</sup>	\$602.3	\$396.5	

<sup>a</sup> This is a net amount representing the \$20 million appropriated and authorized for obligation by Congress under Public Law 99-190 for research grants, as adjusted for the application of the sequestration provisions in Public Law 99-177.

<sup>b</sup> Includes \$9.5 million for research grants and \$300,000 in adjustments obligated during the report period for commodities contracted for in prior years.

<sup>c</sup> Includes naval petroleum reserve receipts of \$68.2 million; silver sales receipts of \$12.1 million; and receipts from disposals in prior years of \$1.4 million.

<sup>d</sup> This is a net amount representing \$9.3 million in research grants and \$100,000 deobligated.

on of \$35.6 million pursuant to Public Law 99-177.

pile materials totaling \$524,632,415; receipts from \$,635; and net appropriations for research grants of \$,000,000. The Fund total \$985.2 million.

# IV. ADMINISTRATION OF THE STOCKPILE PROGRAM

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## Overview

The Strategic and Critical Materials Stock Piling Act provides that a stock of strategic and critical materials is to be maintained to decrease dependence upon foreign sources of supply in times of national emergency. Executive Order 12155 vests the responsibility for planning the stockpile program in the Director of the Federal Emergency Management Agency. (See "Preface" for subsequent legislative changes.)

The Stock Piling Act requires that the stockpile inventory be sufficient to cover U.S. needs for not less than three years of a national emergency. The President approves stockpile policy guidance assumptions regarding changes in a wartime civil economy, wartime foreign trade patterns, and foreign and domestic production levels for stockpile materials.

These guidelines are followed in determining the stockpile goals which represent the difference between estimated supply and projected requirements for each strategic material. Periodic review and updating of the goals are required to ensure a current estimate of our Nation's vulnerability to resource shortages during an emergency.

### The President's Modernization Proposal

The President decided to propose a modernization of the National Defense Stockpile of strategic materials. This proposal is based in part on a 2-year interagency study by 12 agencies. The Administration intends to continue to consult and work with the Congress on this important national security program before the new stockpile goals are transmitted to the Congress pursuant to Section 3 of the Strategic and Critical Materials Stock Piling Act.

Included as Appendix 5 is a reference copy of the original news release issued by the White House on July 8, 1985, which provides details on the goal

reduction element of the President's modernization proposal.

In August 1986, the General Accounting Office (GAO) issued an interim briefing report "assessing whether the NSC stockpile study is a sufficient basis for U.S. mobilization planning, including the proposed changes in National Defense Stockpile goals." The report, which questioned certain of the assumptions used in arriving at the proposed stockpile goals, was responded to by the National Security Council. Reference copies of summaries of these materials are provided in Appendix 6.

## ANNUAL MATERIALS PLAN

Pursuant to Section 11(b) of the Stock Piling Act, the management plan for restructuring the inventory of the stockpile is provided through the development of the Annual Materials Plan (AMP). The AMP is the product of a major interagency effort that develops an annual list of acquisition, disposal, and upgrading actions for stockpile materials. The AMP is developed in a manner that balances National Defense Stockpile requirements against the need to avoid undue market disruption and to conform with budget limitations.

The AMP is submitted by the Director of the Federal Emergency Management Agency (FEMA) to the Committees on Armed Services of the Senate and the House of Representatives. Any revisions to the initial AMP each year are similarly developed and, in accordance with Section 5(a)(2) of the Stock Piling Act, are submitted to Congress by the Director of FEMA when changed market conditions or other factors require such action. During the report period, additional details were submitted on the Fiscal Year 1987 AMP to separately identify disposals under existing and proposed law and currently approved Stockpile goals, as well as to provide planning information for the four succeeding years. A copy of that letter is included in this report as Appendix 7.

## LEGISLATIVE ACTIVITIES

### Enacted Legislation

During the report period no legislation affecting the National Defense Stockpile program was enacted into law. (See "Preface" for reference to subsequent legislative changes.)

### Other Legislative Action

H.R. 4781 and S. 2645 were introduced during the report period. Final action was not taken on this proposed legislation during the reporting period.

*H.R. 4781* was introduced by Congressman Bennett on May 8, 1986, and referred to the Committee on Armed Services. H.R. 4781 was incorporated into H.R. 4428, the National Defense Authorization Act for 1987, which was reported out of the Committee on Armed Services on July 25, 1986, (House Report 99-718) and passed the House of Representatives on August 15, 1986. The major provisions of H.R. 4781 which would amend the Strategic and Critical Materials Stock Piling Act include:

- Any strategic and critical material and its quality, quantity, and form to be stockpiled are to be determined by law.
- Stockpile goals are to be the determinations in effect as of October 1, 1984, until otherwise provided by law.
- Sections 5 (revisions to the annual materials plan), 6 (stockpile management), 10 (advisory committees) and 11 (reports to Congress) may only be delegated to the Secretary of Defense.
- Appropriations for the operation of the National Defense Stockpile and for acquisitions through the National Defense Stockpile Transaction Fund shall be made to the Department of Defense as part of appropriations for the military functions of the Department.
- The Secretary of Defense may enter into an interagency agreement with the head of any other department or agency for the performance of

stockpile-related functions specified in the agreement.

- The Secretary of Defense is to reimburse agencies for expenses incurred relating to the National Defense Stockpile.
- Uses of the Stockpile Transaction Fund are extended to include the development of current specifications of stockpile materials and the upgrading of existing stockpile materials to meet current specifications (including transportation related to such upgrading), testing and quality studies of stockpile materials, and other reasonable requirements for management of the Stockpile.
- The Secretary of Defense is to provide for the refining or processing of any material when necessary to convert such material into a form more suitable for storage and subsequent disposition.
- An annual report is to be submitted to Congress by the Secretary of Defense with recommendations on stockpile requirements and supporting national emergency planning assumptions.
- The annual report is to include materials identified by the Secretary as necessary for the security of the United States, essential to the economy of the United States, and obtained from foreign sources.
- Each material identified is to be classified as follows:
  - Class A includes those materials not produced in the United States or produced in the United States in limited quantities, and the net import reliance of the United States for the material is greater than or equal to 65 percent.
  - Class B includes those materials produced in the United States but not in sufficient quantities, and the net import reliance of the United States for the material is greater than or equal to 30 percent, but less than 65 percent.

- Class C includes those materials produced in substantial quantities in the United States, and the net import reliance is less than 30 percent.

The quantities for each of these classes are to be set at the levels of three, two, and one year's domestic net imports for Classes A, B, and C, respectively.

- The Secretary of Defense is to provide a report on the effect (including the cost and the impact on world markets) of establishing the stockpile requirements under the above formula.
- When the stockpile requirements recommended by the Secretary of Defense differ from the materials and quantities that are identified under the formula, the Secretary is to provide in the report a detailed explanation for such differences.
- The Secretary of Defense is to conduct a detailed analysis supporting the recommended quantity and quality for each material recommended as a strategic and critical material.
- The Secretary of Defense is to conduct a detailed review of the stockpile requirement for each material at least once every five years.
- If the Secretary of Defense determines that the stockpile requirement for a material should be revised, then a report is to be submitted to Congress that notifies Congress of the revision, the recommended stockpile requirement, and the assumptions used in determining the new requirement.

S. 2645, identical to H.R. 4781, was introduced by Senator McClure on July 16, 1986, and referred to the Committee on Armed Services. The Senate tabled S. 2645 on August 8, 1986. (See "Preface" for subsequent legislation enacted.)

S. 2638, the National Defense Authorization Act for Fiscal Year 1987, was passed by the Senate on August 9, 1986. Stockpile provisions under Title XI of this Act include:

- No action may be taken before April 1, 1987, to implement or administer any change in a stockpile goal in effect on October 1, 1984, that results in a reduction in the quality or quantity of any strategic and critical materials to be acquired for the National Defense Stockpile.
  - Disposals for cash of remaining and newly authorized excess materials in the National Defense Stockpile would be allowed during Fiscal Year 1987 if the balance in the Stockpile Transaction Fund exceeds \$250 million.
  - \$120,000,000 is authorized to be appropriated for Fiscal Year 1987 for the acquisition of stockpile materials.
  - Uses of the Stockpile Transaction Fund are extended to include storage, development of specifications, upgrading expenses, testing and quality studies of stockpile materials, material and mobilization studies, and other reasonable requirements for management of the Stockpile.
  - A 7-year ferroalloy upgrading program is required to convert stockpile chromite and manganese ore to 374,000 short tons of high carbon ferrochromium and 472,000 short tons of high carbon ferromanganese.
- H.R. 5294*, making appropriations for Fiscal Year 1987 for the General Services Administration, among other purposes, passed the House on August 6, 1986. Provisions adopted regarding the National Defense Stockpile include:
- \$29,412,000 is to be appropriated for Fiscal Year 1987 for the transportation, processing, refining, storage, security, maintenance, rotation, and disposal of materials contained in or acquired for the stockpile and shall remain available through Fiscal Year 1988.
  - For Fiscal Year 1987, in addition to the funds previously appropriated for the National Defense Stockpile Transaction Fund, an additional \$5 million is appropriated, to be available until expended, for a grant for construction of a strategic materials research facility at the University of Massachusetts at Amherst.

- Effective January 15, 1987, none of the funds made available by H.R. 5294 or in any other fiscal year may be used to store, maintain or protect more than 127,911,736 troy ounces of silver deposited in the National Defense Stockpile.
- The Administrator of General Services, or any Federal officer assuming the Administrator's responsibilities with respect to management of the stockpile, shall use all proceeds generated from the disposal of silver to purchase, not later than October 1, 1988, stockpile materials to meet National Defense Stockpile goals in effect on October 1, 1984.
- No later than October 1, 1988, the Administrator of General Services, or any Federal officer assuming the Administrator's responsibilities with respect to management of the stockpile, shall use all funds authorized and appropriated before January 1, 1985, from the National Defense Stockpile Transaction Fund to evaluate, test, relocate, upgrade or purchase stockpile materials to meet National Defense Stockpile goals in effect on October 1, 1984.

*H.R. 5438*, the Department of Defense Appropriations Bill, 1987, was reported out of Committee (Report 99-793) on August 14, 1986, and contained the following provision on the National Defense Stockpile:

- Effective January 15, 1987, none of the funds made available by H.R. 5438 may be used to store, maintain or protect more than 127,911,736 troy ounces of silver deposited in the National Defense Stockpile.

## Hearings

On May 6, 1986, the Subcommittee on Preparedness of the Committee on Armed Services of the U.S. Senate held a hearing on the National Defense Stockpile. Topics covered included legislative reform proposals for the Stockpile, the Administration's proposed stockpile goals and recommended stockpile acquisitions and disposals. EMA, as the Administration spokesman at the

hearing, coordinated a presentation on the proposed Stockpile goals. The presentation included representatives from the Departments of Commerce, Defense, the Interior, and State and GSA and the Council of Economic Advisors.

The Administration presentation, partially in closed hearing, focused on a description of the stockpile study chaired by the National Security Council which provides a basis for the Administration's announcement of July 8, 1985, concerning proposed changes in goals (see Appendix 5). Among topics covered were the methodology and assumptions regarding the war scenario, available energy, level of domestic economic activity, materials supply/demand availability, political reliability, shipping losses, potential substitutes for stockpile materials, defense expenditures, and related force levels.

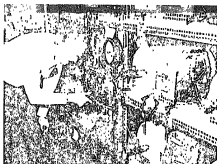
Other witnesses at the hearing were Senator James McClure and Congressman Charles E. Bennett who testified in behalf of S. 2645, a bill to transfer stockpile management to the Secretary of Defense and to determine stockpile requirements by law, among other purposes.

## RESEARCH AND DEVELOPMENT

### Mineral Resource Assessment

U.S. Geological Survey (USGS) geologists have developed a predictive model for the origin of important zinc and lead deposits based on research on fluid inclusions (tiny amounts of liquid and vapor trapped in minerals when they form) together with a synthesis of other geologic information. The Ozark region of the central United States (Missouri, Arkansas, Kansas, and Oklahoma) hosts the major deposits of zinc and lead in the Southwest Missouri and Tri-State districts, as well as the smaller Northern Arkansas and Central Missouri districts. These deposits are not only one of the world's major sources of zinc and lead, but also are an important potential source of cobalt, silver, copper, and nickel. Until recently, little was known about the factors that localize ore deposition in these deposits, which are called "Mississippi Valley-type" deposits. Information on the original temperature and

chemistry of ore-forming fluid based on fluid-inclusion studies, along with a knowledge of temperature changes in rocks based on remnant magnetism and fission tracks, indicate the passage of hot fluid through the region approximately 300 million years ago. New hydrologic computer modeling has confirmed the viability of long-distance fluid migration through highly permeable sandstones and carbonates; the time of the fluid flow indicates that the collision of the North American and South American continental plates played a major role in driving the ore-forming fluids northward from a source in the Arkoma basin. This explanation of the genesis and geologic setting of zinc and lead deposits can be used to identify favorable exploration sites and will permit better assessment and development of domestic and foreign sources of zinc, lead, and accessory metals (see photo of Dr. Hemley with high pressure-temperature equipment).



*Dr. J. J. Hemley, USGS geologist, applies pressure to laboratory equipment used for high pressure-temperature hydrothermal studies. Experiments that estimate the pressures and temperatures of ore-deposit formation provide important information for theories of how strategic mineral deposits were formed and give geologists clues on how to search for new deposits.*

Cobalt-copper deposits near Blackbird, Idaho, have been the subject of exploration activity by Noranda Exploration, Inc. (in 1978-82) and of cooperative

studies by USGS on the geochemistry of ore formation. Cobalt was discovered in the Blackbird area in 1901 and several ore zones were outlined by exploration work of the Bureau of Mines and USGS as a result of demand for cobalt in World War II. Recent studies described in USGS Open-File Report 86-430, "Volcanogenic character of sediment-hosted cobalt-copper deposits in the Blackbird mining district, Lemhi County, Idaho—An interim report," have shown that an exploration strategy designed to find similar deposits should consider much more than the original sedimentary nature of the Yellowjacket Formation, the sequence of metamorphosed beds of siltstones and sandstones in which the mineral deposits occur. The Yellowjacket Formation also contains submarine volcanic rocks, indicative of sea-floor deposits that were formed at the edge of a continent. This information, when evaluated together with unpublished chemical analyses of 312 samples of drill core and viewed from the perspective of modern theories of plate tectonics, suggests that exploration should focus on iron-rich volcanic and sedimentary rocks that have the characteristics associated with this ancient environment. Prospective ore targets are located near the centers of this past sea-floor volcanic activity.

World resources of bauxite, the principal raw material used by the aluminum industry, are the subject of an authoritative publication by the USGS (Professional Paper 1076-B). The report presents revised and updated information about the geology, distribution, and quantities of reserves and resources of bauxite, information which was contained in parts of earlier reports by the Bureau of Mines and USGS. The report was prepared in response to increasing demands for information on bauxite resulting from wider recognition of the increased dependence on foreign sources for this essential raw material and its importance to the industrial economy of the United States.

The USGS and Bureau of Mines hosted the 7th Working Group meeting of the International Strategic Minerals Inventory (ISMI) in September 1986. Started in 1981 by the USGS, the Bureau of Mines, and similar agencies in Canada and Germany, this six-nation cooperative program's goal

is to gather, analyze, and publish information on the world's major mineral deposits. The working group made final additions to a report on platinum-group metals, the fifth in a series of ISMI summary reports published in the USGS Circular 930 series. Progress was reviewed on similar reports on cobalt, graphite, titanium, tungsten, and vanadium. Delegates to the ISMI meeting, held at the USGS offices in Menlo Park, California, also attended a public meeting at the University of Nevada, Reno, where scientists from the USGS and the Nevada Bureau of Mines and Geology presented the results of mineral-resource assessment studies in the Tonopah, Nevada,  $1^{\circ} \times 2^{\circ}$  quadrangle. Precious metals operations in northern California and Nevada were the subject of field examinations by this international group of geologists, mining engineers, and mineral economists (see photo of two delegates examining map).



*Modern computer technology is required for speedy and accurate entry and retrieval of map-related information in the USGS Mineral Resources Data System (MRDS), an 84,000-record data bank of mineral deposit information. Here, Antoinette Medlin (at left), computer systems analyst, reviews output from map plotter tied to MRDS system, while Melissa Stoltz (at right), computer assistant, digitally encodes map information for entry into the data bank.*

The USGS was represented at two international scientific meetings that focused on the geologic aspects of strategic minerals suppliers. At the 7th

Symposium of the International Association of the Genesis of Ore Deposits (IAGOD) held in Lulea, Sweden, in August 1986, the USGS barite mineral-resource geologist presented the results of research on shale-hosted barite nodules of the Appalachian basin.

At the International Sedimentological Congress held in Canberra, Australia, in August 1986, the USGS titanium mineral-resource geologist presented the results of USGS research concerning the influence of climate in past geologic periods on the formation of beach sand concentrations of titanium minerals, research which has important implications for mineral exploration strategies. In addition to having a continental source for the erosion of heavy minerals, a warm humid climate is essential for weathering to remove unstable minerals, break up composite mineral grains, and remove the non- $\text{TiO}_2$  part of ilmenite by leaching, thereby concentrating the economic minerals.

Studies of deposits along the southeastern coast of the United States show that the oldest, southernmost sands are most weathered and that climate belts presently between  $35^{\circ}\text{N}$  and  $35^{\circ}\text{S}$  latitudes appear most efficient in producing assemblages enriched by weathering. While in Australia, the USGS specialist also visited Australia's east coast rutile mining province. New heavy-mineral sands deposits are being developed at Duress and Faillford in New South Wales. Interest in exploration for and development of rutile deposits is attributed to the recent high price of rutile coupled with the decline of the Australian dollar relative to other currencies. Previous rutile production in New South Wales has been from deposits of Recent age (less than 10,000 years old), but these two newly developed deposits are of Pleistocene age (10,000 to 2 million years old). Exploration continues for new deposits in Pleistocene sands; although heavy-mineral grades are low in these older deposits, the presence of rutile and possibly ilmenite enriched in  $\text{TiO}_2$  content by weathering makes these deposits commercially attractive.

The Minerals Management Service (MMS) through the State of Hawaii has prepared a Draft Environmental Impact Statement (DEIS) for the possible leasing of cobalt-rich manganese crusts in the

Hawaii Archipelago and Johnston Island Exclusive Economic Zone (EEZ). The leasing proposal consists of offering 26,910 square kilometers (approximately 6.65 million acres) of EEZ lands for lease. The estimates of potential metal resources in the proposed lease area are 2.6 million tonnes of cobalt, 1.6 million tonnes of nickel, and 81 million tonnes of manganese. Unknown amounts of platinum are also suspected but unconfirmed in the deposits. The deposits lie on the seafloor in the form of crusts or pavements of oxide minerals in water depths between 800 to 2400 meters on the flanks of volcanically formed islands and seamounts. The present schedule calls for the publication of the draft DEIS in November 1986, followed by public hearings and a comment period, with the final EIS to be published in the spring of 1987. The leasing offering, if approved by the Secretary, would occur in 1988 with leases issued before the end of that year. The preparation of the DEIS was completed with oversight by the Joint Federal-State of Hawaii Task Force, established in 1984 by the Secretary of the Interior and the Governor of Hawaii. The MMS funded the required resource and environmental baseline studies and the preparation of the DEIS, which to date approximates \$2.6 million.

During July and August of 1986 a series of scientific dives were made on prospective resource sites on the Gorda Ridge off the coast of California, using the Navy's deep diving submersible, SEACLIF. A total of eight successful dives resulted in the recovery of a substantial volume of polymetallic sulfide samples and excellent video tape coverage. These samples and photographs are now undergoing detailed analysis and examination. Marine scientists discovered large deposits containing copper, lead, zinc, gold, and silver during the series of submersible dives on the Gorda Ridge in about 11,000 feet of water 150-175 miles offshore. The dive program was coordinated by the Gorda Ridge Technical Task Force, a joint Federal/State working group established in 1984 by the Secretary of the Interior and the Governors of California and Oregon. The objective of the dive program was to assess the mineral resources of the Gorda Ridge, which is located within the U.S. EEZ (see photo "U.S. Navy Submersible").



*U.S. Navy Submersible vessel SEACLIF being raised after a successful dive in which samples of metal sulfide deposits were recovered off the Gorda Ridge near California in August, 1986.*

The Secretary of the Interior and the Governor of North Carolina, in August 1986, created a joint State/Federal task force to define issues surrounding the development of non-energy minerals in the U.S. EEZ offshore North Carolina. East Carolina University researchers estimate the phosphorite deposits of southern Onslow Bay to contain at least 3.75 billion tonnes of phosphate concentrate. Phosphates are a primary component of agriculture fertilizers.

The Bureau of Mines continued its field reconnaissance studies and bulk sampling of strategic and critical mineral occurrences in a variety of locations during FY 1986. Initial characterization and metallurgical testing are performed at the Albany Research Center, Oregon. Those samples that warrant more detailed beneficiation research are forwarded to the Bureau's Salt Lake City Research Center in Utah. The most recent bulk sample consisted of one ton of copper-nickel sulfide-bearing rock that contains by-product cobalt and platinum-group metals. The Bureau also continued its investigations of strategic and critical minerals in Alaska including a columbium-bearing regolith on upper Idaho Gulch, near Tofty, Alaska. Two regolith lenses contain 340,000 pounds of columbium resources at an average grade of 0.07 percent. The Juneau Mining District and Goodnews Bay Mining District studies that started in FY 1985 are continuing. These investigations will identify the type, amount, and distribution of mineral deposits, determine ore reserves, study beneficia-

tion technologies for the ore, and address economic and legislative effects on mineral development.

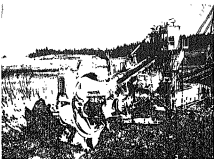
Large quantities of cobalt are present in spent copper leach solutions. These solutions are one of the most significant, readily accessible domestic resources of cobalt. Potential recovery from an existing stream located at one major United States leaching operation approaches 1,300,000 pounds annually. Additionally, five other domestic copper leach solutions, containing significant cobalt values, have been identified. Bureau of Mines researchers have developed a procedure using continuous ion exchange to extract cobalt and other metals from these spent leach solutions. The process was demonstrated in a 12-ft. high multiple-compartment, continuous ion-exchange column with over 95 percent of the cobalt being extracted. Solvent extraction procedures were used to coextract impurities and produced a cobalt electrolyte from which high-purity metallic cathodes were electroplated. Preliminary economic evaluations of the process are favorable. With credits for zinc, nickel, and copper byproducts, the operation cost was estimated to be about \$10 per pound of cobalt produced. Industrial representatives have expressed their interest in a pilot-scale demonstration of the cobalt recovery process.

Manganese is an essential alloying element in nearly all steels to increase strength, toughness, hardness, and hardenability. Approximately 10 to 11 pounds of manganese are used per short ton of raw steel produced. Manganese also is important in the production of cast iron. At present, there are no known satisfactory substitutes for manganese in the making of high-quality iron and steel. The United States has virtually no high-grade reserves of manganese, but low-grade deposits are known. Conventional beneficiation techniques have not proven to be economical for the resources and tests have resulted in poor recoveries. Consequently, the Bureau of Mines is investigating a pre-reduction step using cheap carbon sources to treat the lower grade materials prior to smelting in an electric arc furnace. The pre-reduction step should improve overall process efficiency and reduce costs, thus making the low-grade domestic resources more attractive for development in the event they should be needed as sources of manganese for the iron and steel industry (see photo of reduction kiln).



*A 500-kilogram reduction kiln used by the Bureau of Mines to treat low-grade manganese resources.*

The wear of equipment is a significant cost in the mining and processing of minerals. To combat wear, parts are made from steel alloys containing chromium, cobalt, manganese, molybdenum, nickel, tungsten, or vanadium, or common steel parts are surfaced with hard coats by welding the alloy on to the wear-prone surfaces. The Bureau of Mines has developed a new technique to form a hard surface alloy on steel at the time it is cast into the desired shape. The new method reduces the amount of hard surfacing alloy required as well as eliminating the costly welding process (see photo of bucket wheel excavator).



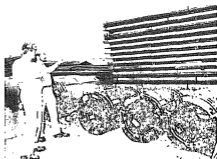
*To reduce wear, an improved technique to put hard surfaces on materials, such as the teeth of this bucket-wheel excavator, has been developed by the Bureau of Mines.*

The Bureau of Mines developed a slimes dewatering process utilizing polyethylene oxide (PEO) as the flocculant. Although the initial target of this research effort was settling of Florida phosphate slimes, application of the PEO process, principally to reduce turbidity, was envisioned for Alaska placer operations. Four demonstrations were performed in interior Alaska under varying conditions. Results of the demonstrations indicated two benefits of PEO dewatering: it materially improves reclamation procedures and also enhances effluent water quality although not necessarily to the degree required by the stringent State water quality standards. The PEO process is the best available control technology demonstrated to date and the data developed by the Bureau demonstrations could be helpful in initiating legislation to amend State water quality standards for placer mine effluents possibly on a site-by-site basis.

Under the Department of the Interior's Mineral Institutes program (authorized by Public Law 98-409), grants totalling \$9.4 million were made to 31 institutions of higher learning which specialize in research benefiting the mineral sector of the economy and in training scientific and technical personnel. Since 1978 grants totaling \$75 million from the Federal government, which are supplemented with substantial State and private funds, have been made available. Improved training for personnel and knowledge relating to the locating, mining, and processing of minerals serves to support the availability of strategic and critical minerals which provide the basis for our manufacturing and other industries. In addition to many diverse projects at the 31 institutions, research is also supported in broad areas of technical expertise applicable across the minerals sector at five Generic Mineral Technology Centers, namely: Mine Systems Design and Ground Control, Pyrometallurgy, Mineral Industry Waste Treatment and Recovery, Comminution, and Respirable Dust.

Thirty-two of fifty-four foreign trips to fifteen countries taken by Bureau of Mines personnel in the second half of FY 1986 were made in support of Bureau mining and metallurgical research programs. Twenty-two of the total foreign trips were taken in support of the mineral information gather-

ing and policy analysis programs of the Bureau (see photo "Dr. John Papp").



*Dr. John Papp (right) of the Bureau of Mines and an official of the Southern Cross stainless steel plant of Middelburg Steel & Alloys near Middelburg, South Africa, inspect strategic metals.*

The Bureau of Mines continued to maintain its close cooperative research relationship with Canada. In May at the annual meeting of the Bureau of Mines and the Canada Centre for Mineral and Energy Technology (CANMET) in Sudbury, Ontario, the Director of the Bureau signed a five-year extension to the existing umbrella agreement between the two organizations on cooperation in mining, metallurgy, and energy research. The Director also signed a new agreement with the Mineral Policy Sector of the Department of Energy, Mines and Resources of Canada, for joint cooperation in mineral economic and engineering information. Other Bureau travel to Canada included participation in the International Symposium on the Environmental and Health Effects of Cobalt, the 17th Rare Earth Research Conference, and the International Symposium on Nickel Metallurgy. Specific project travel to Canada involved work on diesel control systems, mine subsidence, mine accident prevention, methane gas control, biohydrometallurgical research, column flotation technology, and melting of incinerator residues.

In May, a Bureau delegation visited China to negotiate the proposed protocol on metal mining

and minerals research cooperation with the China National Nonferrous Metals Industry Corporation and the proposed annex to the China-U.S. Department of Energy Fossil Energy Protocol on coal mining research cooperation with the Chinese Coal Ministry, and to visit several research institutes, mines and smelters.

Bureau research travel funded through the State Department Science and Technology Program included cooperative programs with two mining institutes in Yugoslavia on longwall coal mining techniques, coal mining land reclamations, lead-zinc dust control, and methane gas control and with the Spanish research organization Centro Nacional de Investigaciones Metalurgicas (CENIM) on high temperature, direct reduction iron ore technology.

Bureau researchers presented a short course on underground coal mine instrumentation for the staff of the Instituto de Pesquisas Technologicas, Sao Paulo, Brazil; consulted with Saudia Arabia on the transfer of Bureau-developed iron-ore agglomeration technology; attended a meeting of the United Nations Committee of Experts on the Transport of Dangerous Goods (explosives) in Geneva; worked with the National Coal Board of the United Kingdom on a program to transfer U.S. roof-bolting technology to England; attended international symposiums on underground mining and on jet-cutting technology in the United Kingdom; and participated in a seminar on the hydrologic impact of mine closure in Madrid.

Bureau representatives also participated in the 4th International Ferroalloys Congress in Brazil, the 56th Conference of the International Fertilizer Institute, and the initial meeting of the World Phosphate Institute in Thailand, as well as participating in the Organizing Committee meeting in Australia of the World Mining Congress. Other Bureau specialists visited chromium operations in South Africa and Brazil, fluorospar industries in France, Spain, and Belgium, graphite mines in Brazil, and mining operations in Yugoslavia, West Germany, Norway, Sweden, and Australia. Bureau personnel also participated in International Mineral Statistics Coordination Meetings in West Germany and the United Kingdom.

The Bureau of Mines prepared a report, "Manganese Industry of the U.S.S.R.," covering manganese reserves, mining technology, ferroalloy production, trade and consumption. The data demonstrate that, in all likelihood, increasing difficulties will be faced in the future by the manganese industry of the U.S.S.R. Although the U.S.S.R. is the world's largest producer of manganese, its reserves of high-grade ore are being rapidly depleted and, recently, imports have been necessary. Soviet electric furnace ferromanganese capacity has expanded, creating additional demand for high-grade ore. The U.S.S.R. has extensive reserves of manganese carbonate ore, although the technology for using such ores is high cost and not well established. The U.S.S.R. also has an opportunity to increase the life of its manganese supply through more efficient manganese consumption in its steelmaking. The U.S.S.R. uses about twice as much manganese per ton of steel compared to other industrial countries.

## QUALITY AND FORM REQUIREMENTS STUDIES

The National Materials and Minerals Policy Research and Development Act of 1980 (P.L. 96-479) mandated a report to the Congress on actions taken by the Administration to implement the Act. In the "National Materials and Minerals Program Plan and Report to Congress," submitted on April 5, 1982, pursuant to that Act, the President noted the importance of stockpile quality and form requirements and the need for assessments. The report stated:

"In the past, questions have been raised about the quality of the stockpiled materials. In addition, the form in which material is held may not be ideal for current industrial use. Recently steps were initiated to address the adequacy of the quality and the appropriate mix of alternative forms of existing materials.

"Since the material in the stockpile is old, a careful review of the quality and form of stockpiled materials is in order. Therefore, this Administration will establish a panel, with appropriate private sector input, to review the extent of material deficiencies and to recommend remedial action, if needed."

Responding to that guidance, FEMA and the Department of Commerce, through an interagency agreement, undertook quality and form assessments for cobalt, chromium, nickel, vanadium, columbium, and tantalum. The American Society for Metals (ASM), because of its ability to assemble panels of industry experts, was selected to conduct the studies. All of the assessments have now been completed, the last reports on columbium, tantalum, and vanadium having been delivered during the report period.

During the report period, FEMA entered into a new interagency agreement with the Department of Commerce, under which the ASM will begin quality and form assessments for gallium, germanium, other minor metals required for high-technology applications, and fiber constituents of composites used in aircraft and other military applications. These assessments are designed to identify critical applications, supply/demand outlook, and domestic production and processing capability. The first ASM panel meetings on gallium and germanium were scheduled for November 1986 and will involve representatives from the producing and consuming industries and government representatives from the Departments of Commerce, Defense, Energy, and the Interior, the General Services Administration, and the Federal Emergency Management Agency. The results of these assessments will form the basis for detailed reviews and determinations on stockpile requirements.

## PROPERTY MANAGEMENT

Section 6 of the Strategic and Critical Materials Stock Piling Act grants authority to the President to conduct the property management functions of the National Defense Stockpile. Executive Order 12155 delegates this property management authority to the Administrator of General Services under the policy guidance of FEMA as provided in Section 3 of the Act. The Federal Property Resources Service (FPRS) of GSA is assigned the acquisition, disposal, storage, maintenance, security, refining, processing, and rotation activities of the Stockpile program. (See "Preface" for reference to subsequent legislative changes.)

## Inventory Quality Assessment

The quality of certain materials must be assessed when there is possible deterioration, when there is an incomplete evaluation, or when the quality is unknown against current specifications that incorporate significant changes due to technological advances since the materials were first acquired. Commodities selected for assessment this year were beryl ore, low carbon ferrochromium, mica, technically-specified rubber, titanium, tungsten, and vanadium pentoxide. All of these have been sampled and analyzed to obtain complete up-to-date analysis and to determine if physical or chemical changes have taken place during storage.

## Storage Depots and Sites

The operation and maintenance functions of the National Defense Stockpile storage depots and sites have been scheduled for study and economic review under the requirements of the OMB Circular No. A-76 (revised), Performance of Commercial Activities, August 4, 1983. The study was begun in Fiscal Year 1986 and includes shipping, receiving, storage, maintenance, and other related services performed at the storage depots/sites. The results of the study will be subject to a cost comparison pursuant to the OMB Circular to determine the most economical method of performing these services. The outcome of the cost comparison will determine if the functions are retained by the Government or contracted out to the private sector. The entire process is scheduled for completion by the end of Fiscal Year 1987.

## PURCHASE SPECIFICATIONS

Since 1962, the Department of Commerce has had responsibility for developing, maintaining, and issuing (after FEMA approval) stockpile purchase specifications and special instructions. This arrangement is conducted under a letter of agreement originally between the Secretary of Commerce and the Director of the Office of Emergency Planning, a predecessor agency of FEMA. In 1976 the Department of Commerce established an interagency committee—the Interagency Committee for Stockpile Purchase Specifications and Special

Instructions—to assist in the development and review of purchase specification and special instructions documents. Since 1976, the Committee—chaired by the Department of Commerce and with membership representing the Departments of

Defense, the Interior, and Agriculture, and the General Services Administration and FEMA—has developed or revised National Stockpile Purchase Specifications for 59 materials. (See Figure 9.)

Figure 9

## PURCHASE SPECIFICATION REVISIONS SINCE 1976

MATERIALS	YEAR											
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	
1. Aluminum									X			
2. Aluminum Oxide Abrasive, Fused, Crude					X							
3. Antimony Metal					X							
4. Antimony Sulphide Ore & Concentrates Chemical Grade					X							
5. Asbestos - Chrysotile							X					
6. Bauxite - Abrasive Grade					X							
7. Bauxite, Metal Grade, Jamaica Type							X					
8. Bauxite, Refractory Grade							X					
9. Beryl Concentrates					X							
10. Beryllium - Copper Master Alloy					X							
11. Beryllium Metal, Hot-Pressed Powder Billets, Grade A								X				
12. Beryllium Metal, Hot-Pressed Powder Billets, Instrument Grades						X				X		
13. Beryllium Metal, Vacuum Cast Ingot					X							
14. Bismuth												
15. Cadmium				X								
16. Castor Oil							X					
17. Chestnut Tannin Extract					X					X		
18. Chromite - Chemical Use										X		
19. Chromium Metal										X		
20. Ferrocromium - Low Carbon	X							X				
21. Ferrocromium - High Carbon												
22. Cobalt										X		
23. Columbian Source Materials									X			
24. Copper									X			
25. Cordage Fibers - Sisal		X										
26. Fluorspar - Acid Grade	X											
27. Fluorspar - Metallurgical Grade									X		X	
28. Germanium Metal												
29. Iridium						X						
30. Jewel Bearings						X						
31. Lead									X			
32. Manganese Metal - Electrolytic	X											
33. Ferromanganese (Standard High Carbon)				X				X				
34. Morphine Sulphate												

Figure 9 (continued)

MATERIALS	YEAR											
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	
35. Nickel - High Purity												
36. Opium				X				X				
37. Palladium						X						
38. Platinum						X						
39. Pyrethrum Extract					X							
40. Quebracho Tannin Extract					X							
41. Quinidine Sulfate								X				
42. Quinine Sulfate					X							
43. Rubber - Crude Natural		X										
44. Rubber - Technically Specified Rubber (Hevea)							X					
45. Rubber - Parthenium (Guayule)									X			
46. Rutile						X						
47. Sapphire & Ruby Components, Synthetic						X						
48. Silicon Carbide - Crude						X						
49. Silver					X							
50. Talc (Steatite) Block					X							
51. Talc (Steatite) Lump					X							
52. Tantalum Carbide Powder					X							
53. Tantalum Source Materials						X						
54. Tin					X							
55. Titanium Metal Sponge							X					
56. Vanadium Pentoxide						X						
57. Ferrowanadium		X										
58. Wattle Tannin Extract					X							
59. Zinc									X			

## APPENDIX 1

### NATIONAL DEFENSE STOCKPILE INVENTORY

The data on the National Defense Stockpile inventory given in Table 2 excludes quantities that were sold but not shipped from depots to the purchasers. In the Statistical Supplement (issued by the General Services Administration), the inventory is listed as "Total Inventory in Storage" with a separate line for "Unshipped Sales."

The inventory quantities given in Table 2 combine stockpile and nonstockpile grade materials. Separate quantities for each of these grades can be found in the Statistical Supplement. Non-stockpile grade material may vary only slightly from the stockpile grade and in some cases is temporarily credited toward goals.

In previous reports, where a goal deficit occurred, the excess of another form of the material was credited to offset the shortage. To more clearly depict actual excesses and deficits in the stockpile inventory, actual quantities of each material form held in inventory is given in Table 2, as well as the excess or deficit for each form.

Materials are grouped by "families," and a summary line for each basic family group is included. The materials have been grouped in each family according to their status as raw materials, semifinished products, or finished products that contain the same common ingredient. The values shown in the summary line for each family group are expressed in the basic unit common to all members of the group. In all but three cases, this basic unit is the metal equivalent for each form. There is a different conversion factor for each form because each requires different technology and incurs different losses for conversion. The factors used for calculating these equivalent amounts and the calculation procedure are provided in Appendix 2.

Market values are based on current prices at which comparable materials are being traded. In the absence of current trading, the market values are estimated. The market values are not necessarily the amount that would be realized if the materials were sold. A key to abbreviations used in Table 2 and elsewhere in this report is provided in Table 1.

Table 1  
Abbreviations

AMA LB	- Anhydrous Morphine Alkaloid (Pounds)	ST	- Short Ton
Av Oz	- Avordupois Ounce	ST Ab	- Short Tons of Contained Abrasive Grain
FL	- Flask (76-pound)	ST Al	- Short Tons of Contained Aluminum
KG	- Kilograms	ST Ba	- Short Tons of Contained Beryllium
KT	- Carat	ST Cr	- Short Tons of Contained Chromium
LB	- Pound	ST Mn	- Short Tons of Contained Manganese
LB Cb	- Pounds of Contained Columbium	ST Ni+Co	- Short Tons of Contained Nickel plus Cobalt
LB Co	- Pounds of Contained Cobalt	ST V	- Short Tons of Contained Vanadium
LB Mo	- Pounds of Contained Molybdenum	Tr Oz	- Troy Ounce
LB Ta	- Pounds of Contained Tantalum		
LB W	- Pounds of Contained Tungsten		
LCT	- Long Calined Ton		
LDT	- Long Dry Ton		
LT	- Long Ton		
MT	- Metric Ton		
PC	- Piece		
SOT	- Short Dry Ton		

Table 2

National Defense Stockpile of Strategic and Critical Materials  
Inventory as of September 30, 1966

Material	Unit	Goal	Inventory		Inventory Quantity	
			Quantity	Value (Millions)	Excess	Deficit
1. Aluminum Metal Group						
Alumina	ST Al Metal	7,150,000	4,278,912	\$ 826.8		*2,871,090
Aluminum	ST	0	0	-		
Bauxite, Metal Grade, Jamaica Type	ST	700,000	2,080	2.3		697,920
Bauxite, Metal Grade, Surinam Type	LOT	21,000,000	12,457,740 a/	560.6		8,542,260
	LOT	6,100,000	5,299,597	283.9		800,403
2. Aluminum Oxide, Abrasive Grain Group						
Aluminum Oxide, Abrasive Grain	ST Ab Grain	638,000	259,124	128.6		*378,876
Aluminum Oxide, Fused, Crude	ST	0	50,904	63.6	50,904	
Bauxite, Abrasive Grade	ST	0	249,867	65.0	249,867	
	LCT	1,000,000	0	-		1,000,000
3. Antimony	ST	36,000	37,420	102.9	1,420	
4. Asbestos, Amosite	ST	17,000	34,011	23.8	17,011	
5. Asbestos, Chrysotile	ST	3,000	10,705	19.5	7,705	
6. Bauxite, Refractory	LCT	1,400,000	274,229	63.9		1,125,771
7. Beryllium Metal Group						
Beryl Ore (11% BeO)	ST Be Metal	1,220	1,089	223.1		*131
Beryllium Copper Master Alloy	ST	18,000	17,856	16.0		144
Beryllium Metal	ST	7,900	7,387	94.6		513
	ST	400	290	112.5		110
8. Bismuth	LB	2,200,000	2,081,298	5.8		118,702
9. Cadmium	LB	11,700,000	6,328,809	6.8		5,371,191
10. Chromium, Chem. & Metallurgical Group						
Chromite, Chemical Grade Ore	ST Cr Metal	1,353,000	1,309,688	1146.2		*43,312
Chromite, Metallurgical Grade Ore	SOT	675,000	242,414	11.9		432,586
Chromium, Ferro, High Carbon	ST	3,200,000	2,130,938	248.1		1,069,062
Chromium, Ferro, Low Carbon	ST	185,000	524,352	390.6	b/	
Chromium, Ferro, Silicon	ST	75,000	318,942	418.1	243,942	
Chromite, Refractory Grade Ore	ST	90,000	58,357	52.1		31,643
	ST	20,000	3,763	25.4		16,237
11. Chromite, Refractory Grade Ore	SOT	850,000	391,414	39.1		458,586

Table 2 (continued)

Material	Unit	Goal	Inventory		Inventory Quantity	
			Quantity	Value (Millions)	Excess	Deficit
12. Cobalt	L8 Co	85,400,000	53,109,188	\$ 345.2		32,290,812
13. Columbium Group	L8 Co Metal	4,850,000	2,713,469	14.0		*2,136,531
	L8 Co	100,000	21,372	.6		78,628
	Columbium Carbide Powder					
	Columbium Concentrates	5,600,000	2,019,218	6.5		3,580,782
	Columbium, Ferro	0	930,911	5.3	930,911	
Columbium, Metal	L8 Co	0	44,851	1.6	44,851	
14. Copper	ST	1,000,000	29,048	44.1		970,952
15. Cordage Fibers, Abaca	L8	155,000,000	0	-		155,000,000
16. Cordage Fibers, Sisal	L8	60,000,000	0	-		60,000,000
17. Diamond, Industrial Group	KT	29,700,000	33,063,636	354.2	3,363,636	
	PC	60,000	25,473	1.1		34,527
	Diamond Dies, Small	22,000,000	22,001,344	38.5	1,344	
	Diamond, Industrial, Crushing Bort	7,700,000	11,049,555	314.6	3,349,555	
	Diamond, Industrial, Stones					
18. Fluorspar, Acid Grade	SOT	1,400,000	895,983	155.0		504,017
19. Fluorspar, Metallurgical Grade	SOT	1,700,000	411,738	51.5		1,288,262
20. Germanium	KG	30,000	0	-		30,000
21. Graphite, Natural, Ceylon, Amorphous Lump	ST	6,300	5,497	10.7		803
22. Graphite, Natural, Malagasy, Crystalline	ST	20,000	17,838	53.5		2,162
23. Graphite, Natural, Other than Ceylon & Malagasy	ST	2,800	2,803	2.0	3	
24. Iodine	L8	5,800,000	7,369,781	46.8	1,569,781	
25. Jewel Bearings	PC	120,000,000	74,655,118	84.3		45,344,882
26. Lead	ST	1,100,000	601,018	264.4		498,982

Table 2 (continued)

Material	Unit	Coal	Inventory		Inventory Quantity	
			Quantity	Value (Millions)	Excess	Deficit
27. Manganese, Bat. Grade Group	SDT	87,000	208,165	\$ 19.2	*121,165	
Manganese, Bat. Grade, Natural Ore	SDT	62,000	205,154	15.0	143,154	
Manganese, Bat. Grade, Synthetic Dioxide	SDT	25,000	3,011	4.2		21,989
28. Manganese, Chem. & Metallurgical Group	ST Mn Metal	1,500,000	1,942,475	502.5	*442,475	
Manganese Ore, Chemical Grade	SDT	170,000	171,806	14.1	1,806	
Manganese Ore, Metallurgical Grade	SDT	2,700,000	3,186,496	141.4	466,496	
Manganese, Ferro, High Carbon	ST	439,000	690,892	293.5	b/	
Manganese, Ferro, Low Carbon	ST	0	0	-	-	
Manganese, Ferro, Medium Carbon	ST	0	29,057	19.7	29,057	
Manganese, Ferro, Silicon	ST	0	23,574	11.1	23,574	
Manganese Metal, Electrolytic	ST	0	14,172	22.7	14,172	
29. Mercury	FL	10,500	169,226	30.0	158,726	
30. Mica, Muscovite Block, Stained & Better	LB	6,200,000	5,212,361	27.8		987,639
31. Mica, Muscovite Film, 1st & 2nd Qualities	LB	90,000	1,176,755	13.8	1,088,755	
32. Mica, Muscovite Splittings	LB	12,630,000	14,552,181	22.0	2,022,181	
33. Mica, Phlogopite Block	LB	210,000	130,745	.7		79,255
34. Mica, Phlogopite Splittings	LB	930,000	1,518,951	3.0	588,951	
35. Molybdenum Group	LB Mo	0	0	-	-	
Molybdenum Disulphide	LB Mo	0	0	-	-	
Molybdenum, Ferro	LB Mo	0	0	-	-	
36. Morphine Sulphate and Related Analgesics	AMA LB	130,000	71,303	24.2		*58,697
Crude	AMA LB	0	31,795	4.7	31,795	
Refined	AMA LB	130,000	39,508	19.5		90,491
37. Natural Insulation Fibers	LB	1,500,000	0	-		1,500,000
38. Nickel	ST Ni+Co	200,000	37,222	137.2		162,778

Table 2 (continued)

Material	Unit	Goal	Inventory			Inventory Quantity	
			Quantity	Value (Millions)		Excess	Deficit
39. Platinum Group Metals, Iridium	Tr Oz	98,000	29,590	\$ 12.4			68,410
40. Platinum Group Metals, Palladium	Tr Oz	3,000,000	1,264,602	177.4			1,735,398
41. Platinum Group Metals, Platinum	Tr Oz	1,310,000	452,641	269.8			857,359
42. Pyrethrum	LB	500,000	0	-			500,000
43. Quartz Crystals	LB	600,000	1,848,532	11.1	1,248,532		
44. Quinidine	Av Oz	10,100,000	2,473,109	10.4			7,626,891
45. Quinine	Av Oz	4,500,00	3,245,164	7.8			1,253,836
46. Ricinoleic/Sebacic Acid Products	LB	22,000,000	12,524,242	9.7			*9,475,758
47. Rubber	MT	864,000	127,445	126.2			736,554
48. Rutile	SOT	106,000	39,186	12.9			66,814
49. Sapphire and Ruby	KT	0	16,305,502	.2	16,305,502		
50. Silicon Carbide, Crude	ST	29,000	80,550	36.2	51,550		
51. Silver, Fine	Tr Oz	0	130,005,707	730.5	130,005,707		
52. Talc, Steatite Block & Lump	ST	28	1,081	.4	1,053		
53. Tantalum Group Tantalum, Carbide Powder Tantalum Metal Tantalum Minerals	LB Tg Metal LB Tg LB Tg LB Tg	7,160,000 0 0 8,400,000	2,642,073 28,688 201,133 2,837,943	92.7 4.7 44.2 43.8			*4,517,927 28,688 201,133 5,562,057
54. Thorium Nitrate	LB	600,000	7,121,812	19.5	6,521,812		
55. Tin	MT	42,700	180,889	1,024.5	138,189		

Table 2 (continued)

Material	Unit	Goal	Inventory		Inventory Quantity	
			Quantity	Value (Millions)	Excess	Deficit
56. Titanium Sponge	ST	195,000	35,831	\$ 278.0		158,169
57. Tungsten Group						
Tungsten Carbide Powder	L8 W Metal	50,666,000	74,048,291	260.1	*23,382,291	
Tungsten, Ferro	L8 W	2,000,000	2,032,942	20.2	32,942	
Tungsten, Metal	L8 W	0	2,025,361	24.8	2,025,361	
Tungsten Ores & Concentrates	L8 W	1,600,000	1,898,831	24.7	298,831	
		55,450,000	80,013,111	190.4	24,563,111	
58. Vanadium Group						
Vanadium, Ferro	ST V Metal	8,700	721	8.6		*7,979
Vanadium Pentoxide	ST V	1,000	0	-		1,000
		7,700	721	8.6		6,979
59. Vegetable Tannin Extract, Chestnut	LT	5,000	12,746	8.6	7,746	
60. Vegetable Tannin Extract, Quebracho	LT	28,000	126,618	87.0	98,618	
61. Vegetable Tannin Extract, Wattle	LT	15,000	15,001	10.6	1	
62. Zinc	ST	1,425,000	378,316	347.3		1,046,684
TOTAL VALUE OF INVENTORY				2,334.5		

\* Equivalent quantity. (See accompanying text and Appendix 2.)

a/ Bauxite, Metal Grade, Jamaica Type: Includes 400,000 LOT in the physical custody of BSA, title to which is scheduled to be transferred to the Stockpile during Fiscal Years 1988-1990.

b/ The President's Ferroalloy Upgrading Program and P.L. 99-661 have provided for increases in the inventory in excess of the October 1, 1984, goals for these upgraded forms. Consequently, no excess quantity is listed.

## APPENDIX 2

### CALCULATION PROCEDURE FOR FAMILY GROUPINGS OF MATERIALS

The example below is designed to help the reader understand and perform the conversions and calculations used in determining summary totals for basic family groupings of materials. The purpose of using basic units for each of the families for groups of materials is to place the content of the primary material of interest into a common equivalent measure for easier and more meaningful comparison.

In time of emergency, there would be need for a mix of various forms of each material within a family grouping. Consequently, the stockpile goal for a family group of materials is a mix of products at various stages of upgrading. The goal is calculated by examining expected wartime requirements, availability, and domestic capacity to produce each of the various upgraded forms within the grouping.

There is a different factor for converting each of the forms into a common equivalent measure,

usually the basic metal equivalent. The conversion factors are different because process conversion losses vary. For example, in converting the aluminum metal group into aluminum metal equivalent, the following conversion factors are used:

	Multiple Factor
Bauxite, Metal Grade, Jamaica Type	0.231
Bauxite, Metal Grade, Surinam Type	0.264

These factors are used to convert these two types of bauxite in the stockpile inventory into aluminum equivalent (e.g.,  $12,457,740 \times 0.231 = 2,877,738$ ;  $5,299,597 \times 0.264 = 1,399,094$ ). The total of these two conversions plus the 2,080 short tons of aluminum in metal form in the inventory result in an aluminum family group equivalent in the stockpile inventory of 4,278,912 short tons of aluminum.

## Factors Used for Converting Materials Into Family Groups

Materials	Unit	Multiple Factor	Basic Family Unit
Alumina . . . . .	ST	0.518	Metal Equivalent, Aluminum
Aluminum Oxide, Fused, Crude . . . . .	ST	0.833	Aluminum Oxide, Abrasive Grain
Bauxite, Abrasive Grade . . . . .	LCT	0.641	Aluminum Oxide, Abrasive Grain S.T.
Bauxite, Metal Grade, Jamaica Type . . .	ST	0.231	Metal Equivalent, Aluminum
Bauxite, Metal Grade, Surinam Type . .	ST	0.264	Metal Equivalent, Aluminum
Beryl Ore (11% BeO) . . . . .	ST	0.028	Metal Equivalent, Beryllium
Beryllium Copper Master Alloy (4% Be) .	ST	0.04	Metal Equivalent, Beryllium
Chromite, Chemical Grade Ore . . . . .	ST	0.286	Metal Equivalent, Chromium
Chromite, Metallurgical Grade Ore . . .	ST	0.286	Metal Equivalent, Chromium
Chromiums, Ferro, High Carbon . . . . .	ST	0.714	Metal Equivalent, Chromium
Chromium, Ferro, Low Carbon . . . . .	ST	0.714	Metal Equivalent, Chromium
Chromium, Ferro, Silicon . . . . .	ST	0.429	Metal Equivalent, Chromium
Columbium, Concentrates . . . . .	LB	0.850	Metal Equivalent, Columbium
Diamond Dies, Small . . . . .	PC	0.50	Carat
Manganese, Dioxide, Battery Grade . .	SDT	1.000	Manganese, Dioxide, Battery Grade, Synthetic
Manganese, Chemical Grade . . . . .	ST	0.400	Metal Equivalent, Manganese
Manganese, Metallurgical Grade . . . . .	ST	0.400	Metal Equivalent, Manganese
Manganese, Ferro, High Carbon . . . . .	ST	0.800	Metal Equivalent, Manganese
Manganese, Ferro, Medium Carbon . . .	ST	0.800	Metal Equivalent, Manganese
Manganese, Ferro, Silicon . . . . .	ST	0.720	Metal Equivalent, Manganese
Opium Gum . . . . .	AMA LB	1.000	Opium Salts
Tantalum Minerals . . . . .	LB	0.85	Metal Equivalent, Tantalum
Tungsten Ores and Concentrates . . . . .	LB	0.851	Metal Equivalent, Tungsten

## APPENDIX 3

### STRATEGIC AND CRITICAL MATERIALS STOCK PILING ACT

(P.L. 96-41, 50 U.S.C. 98 *et seq.*) as of September 30, 1986

SEC. 1. This Act may be cited as the 'Strategic and Critical Materials Stock Piling Act'.

#### FINDINGS AND PURPOSE

SEC. 2. (a) The Congress finds that the natural resources of the United States in certain strategic and critical materials are deficient or insufficiently developed to supply the military, industrial, and essential civilian needs of the United States for national defense.

(b) It is the purpose of this Act to provide for the acquisition and retention of stocks of certain strategic and critical materials and to encourage the conservation and development of sources of such materials within the United States and thereby to decrease and to preclude, when possible, a dangerous and costly dependence by the United States upon foreign sources for supplies of such materials in times of national emergency.

#### MATERIALS TO BE ACQUIRED: PRESIDENTIAL AUTHORITY AND GUIDELINES

SEC. 3. (a) The President shall determine from time to time (1) which materials are strategic and critical materials for the purposes of this Act, and (2) the quality and quantity of each such material to be acquired for the purposes of this Act and the form in which each such material shall be acquired and stored. Such materials when acquired, together with the other materials described in section 4 of this Act, shall constitute and be collectively known as the National Defense Stockpile (hereinafter in this Act referred to as the 'stockpile').

(b) The President shall make the determinations required to be made under subsection (a) on the basis of the following principles:

(1) The purpose of the stockpile is to serve the interest of national defense only and is not to be used for economic or budgetary purposes.

(2) The quantities of the materials stockpiled should be sufficient to sustain the United

States for a period of not less than three years in the event of a national emergency.

(c) The quantity of any material to be stockpiled under this Act, as determined under subsection (a), may not be revised unless the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed revision and the reasons for such revision at least 30 days before the effective date of such revision.

#### MATERIALS CONSTITUTING THE NATIONAL DEFENSE STOCKPILE

SEC. 4. (a) The stockpile consists of the following materials:

(1) Materials acquired under this Act and contained in the national stockpile on the day before the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(2) Materials acquired under this Act on or after the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(3) Materials in the supplemental stockpile established by section 104(b) of the Agricultural Trade Development and Assistance Act of 1954 (as in effect from September 21, 1959, through December 31, 1966) on the day before the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(4) Materials acquired by the United States under the provisions of section 303 of the Defense Production Act of 1950 (50 U.S.C. App. 2093) and transferred to the stockpile by the President pursuant to subsection (f) of such section.

(5) Materials transferred to the United States under section 663 of the Foreign Assistance Act of 1961 (22 U.S.C. 2423) that have been determined to be strategic and critical materials for the purposes of this Act and that are allocated by the President under subsection (b) of such section for stockpiling in the stockpile.

(6) Materials acquired by the Commodity Credit Corporation and transferred to the stockpile under section 4(h) of the Commodity Credit Corporation Charter Act (15 U.S.C. 7144(h)).

(7) Materials acquired by the Commodity Credit Corporation under paragraph (2) of section 103(a) of the Act entitled 'An Act to provide for greater stability in agriculture; to augment the marketing and disposal of agricultural products; and for other purposes', approved August 28, 1954 (7 U.S.C. 1743(a)), and transferred to the stockpile under the third sentence of such section.

(8) Materials transferred to the stockpile by the President under paragraph (4) of section 103(a) of such Act of August 28, 1954.

(9) Materials transferred to the stockpile under subsection (b).

(b) Notwithstanding any other provision of law, any material that (1) is under the control of any department or agency of the United States, (2) is determined by the head of such department or agency to be excess to its needs and responsibilities, and (3) is required for the stockpile shall be transferred to the stockpile. Any such transfer shall be made without reimbursement to such department or agency, but all costs required to effect such transfer shall be paid or reimbursed from funds appropriated to carry out this Act.

## AUTHORITY FOR STOCKPILE OPERATIONS

SEC. 5. (a) (1) Except for acquisitions made under the authority of paragraph (3) or (4) of section 6(a), no funds may be obligated or appropriated for acquisition of any material under this Act unless funds for such acquisition have been authorized by law. Funds appropriated for such acquisition (and for transportation and other incidental expenses related to such acquisition) shall remain available until expended, unless otherwise provided in appropriation Acts.

(2) If for any fiscal year the President proposes certain stockpile transactions in the annual materials plan submitted to Congress for that year under section 11(b) and after that plan is submitted the President proposes (or Congress requires) a significant change in any such transaction, or a significant

transaction not included in such plan, no amount may be obligated or expended for such transaction during such year until the President has submitted a full statement of the proposed transaction to the appropriate committees of Congress and a period of 30 days has passed from the date of the receipt of such statement by such committees or until each such committee, before the expiration of such period, notifies the President that it has no objection to the proposed transaction. In computing any 30-day period for the purpose of the preceding sentence, there shall be excluded any day on which either House of Congress is not in session because of an adjournment of more than three days to a day certain.

(b) Except for disposals made under the authority of paragraph (4) or (5) of section 6(a) or under section 7(a), no disposal may be made from the stockpile (1) unless such disposal, including the quantity of the material to be disposed of, has been specifically authorized by law, or (2) if the disposal would result in there being an unobligated balance in the National Defense Stockpile Transaction Fund in excess of \$250,000,000.

(c) There is authorized to be appropriated such sums as may be necessary to provide for the transportation, processing, refining, storage, security, maintenance, rotation, and disposal of materials contained in or acquired for the stockpile. Funds appropriated for such purposes shall remain available to carry out the purposes for which appropriated for a period of two fiscal years, if so provided in appropriation Acts.

## STOCKPILE MANAGEMENT

SEC. 6. (a) The President shall—

(1) acquire the materials determined under section 3(a) to be strategic and critical materials;

(2) provide for the proper storage, security, and maintenance of materials in the stockpile;

(3) provide for the refining or processing of any material in the stockpile when necessary to convert such material into the form most suitable for storage and subsequent disposition;

(4) provide for the rotation of any material in the stockpile when necessary to prevent deterioration of such material by replacement of such material with an equivalent quantity of substantially the same material;

(5) subject to the notification required by subsection (d)(2), provide for the timely disposal of materials in the stockpile that (A) are excess to stockpile requirements, and (B) may cause a loss to the Government if allowed to deteriorate; and

(6) subject to the provisions of section 5(b), dispose of materials in the stockpile the disposal of which is specifically authorized by law.

(b) Except as provided in subsections (c) and (d), acquisition of strategic and critical materials under this Act shall be made in accordance with established Federal procurement practices, and, except as provided in subsections (c) and (d) and in section 7(a), disposal of materials from the stockpile shall be made by formal advertising or competitive negotiation procedures. To the maximum extent feasible—

(1) competitive procedures shall be used in the acquisition and disposal of such materials;

(2) efforts shall be made in the acquisition and disposal of such materials to avoid undue disruption of the usual markets of producers, processors, and consumers of such materials and to protect the United States against avoidable loss; and

(3) disposal of such materials shall be made for domestic consumption.

(c)(1) The President shall encourage the use of barter in the acquisition of strategic and critical materials for, and the disposal of materials from, the stockpile when acquisition or disposal by barter is authorized by law and is practical and in the best interest of the United States.

(2) Materials in the stockpile, the disposition of which is authorized by law, shall be available for transfer at fair market value as payment for expenses (including transportation and other incidental expenses) of acquisition of materials, or of refining, processing, or rotating materials, under this Act.

(3) To the extent otherwise authorized by law, property owned by the United States may be bartered for materials needed for the stockpile.

(d)(1) The President may waive the applicability of any provision of the first sentence of subsection (b) to any acquisition of material for, or disposal of material from, the stockpile. Whenever the President waives any such provision with respect to any such acquisition or disposal, or whenever the President determines that the application of paragraph (1), (2), or (3) of such subsection to a particular acquisition or disposal is not feasible, the President shall notify the Committees on Armed Services of the Senate and House of Representatives in writing of the proposed acquisition or disposal at least thirty days before any obligation of the United States is incurred in connection with such acquisition or disposal and shall include in such notification the reasons for not complying with any provision of such subsection.

(2) Materials in the stockpile may be disposed of under subsection (a)(5) only if the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed disposal at least thirty days before any obligation of the United States is incurred in connection with such disposal.

(c) The President may acquire leasehold interests in property, for periods not in excess of twenty years, for storage, security, and maintenance of materials in the stockpile.

#### SPECIAL DISPOSAL AUTHORITY OF THE PRESIDENT

SEC. 7. (a) Materials in the stockpile may be released for use, sale, or other disposition—

(1) on the order of the President, at any time the President determines the release of such materials is required for purposes of the national defense; and

(2) in time of war declared by the Congress or during a national emergency, on the order of any officer or employee of the United States designated by the President to have authority to issue disposal orders under this subsection, if such officer or employee determines that the release of such materials is required for purposes of the national defense.

(b) Any order issued under subsection (a) shall be promptly reported by the President, or by the officer or employee issuing such order, in writing, to the

Committees on Armed Services of the Senate and House of Representatives.

## MATERIALS DEVELOPMENT AND RESEARCH

SEC. 8. (a)(1) The President shall make scientific, technologic, and economic investigations concerning the development, mining, preparation, treatment, and utilization of ores and other mineral substances that (A) are found in the United States, or in its territories or possessions, (B) are essential to the national defense, industrial, and essential civilian needs of the United States, and (C) are found in known domestic sources in inadequate quantities or grades.

(2) Such investigations shall be carried out in order to—

(A) determine and develop new domestic sources of supply of such ores and mineral substances;

(B) devise new methods for the treatment and utilization of lower grade reserves of such ores and mineral substances; and

(C) develop substitutes for such essential ores and mineral products.

(3) Investigations under paragraph (1) may be carried out on public lands and, with the consent of the owner, on privately owned lands for the purpose of exploring and determining the extent and quality of deposits of such minerals, the most suitable methods of mining and beneficiating such minerals, and the cost at which the minerals or metals may be produced.

(b) The President shall make scientific, technologic, and economic investigations of the feasibility of developing domestic sources of supplies of any agricultural material or for using agricultural commodities for the manufacture of any material determined pursuant to section 3(a) of this Act to be a strategic and critical material or substitutes therefor.

## NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

C. 9. (a) There is established in the Treasury United States a separate fund to be known as

the National Defense Stockpile Transaction Fund (hereinafter in this section referred to as the "fund").

(b)(1) All moneys received from the sale of materials in the stockpile under paragraphs (5) and (6) of section 6(a) shall be covered into the fund. Such moneys shall remain in the fund until appropriated.

(2) Moneys covered into the fund under paragraph (1) shall be available, when appropriated therefor, only for the acquisition of strategic and critical materials under section 6(a)(1) of this Act (and for transportation related to such acquisition).

(3) Moneys in the fund, when appropriated, shall remain available until expended, unless otherwise provided in appropriation Acts.

(c) All moneys received from the sale of materials being rotated under the provisions of section 6(a)(4) or disposed of under section 7(a) shall be covered into the fund and shall be available only for the acquisition of replacement materials.

## ADVISORY COMMITTEES

SEC. 10. (a) The President may appoint advisory committees composed of individuals with expertise relating to materials in the stockpile or with expertise in stockpile management to advise the President with respect to the acquisition, transportation, processing, refining, storage, security, maintenance, rotation, and disposal of such materials under this Act.

(b) Each member of an advisory committee established under subsection (a) while serving on the business of the advisory committee away from such member's home or regular place of business shall be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5, United States Code, for persons intermittently employed in the Government service.

## REPORTS TO CONGRESS

SEC. 11. (a) The President shall submit to the Congress every six months a written report detailing operations under this Act. Each such report shall include—

(1) information with respect to foreign and domestic purchases of materials during the preceding 6-month period;

(2) information with respect to the acquisition and disposal of materials under this Act by harter, as provided for in section 6(c) of this Act, during such period;

(3) a statement and explanation of the financial status of the National Defense Stockpile Transaction Fund and the anticipated appropriations to be made from the fund during the next fiscal year; and

(4) such other pertinent information on the administration of this Act as will enable the Congress to evaluate the effectiveness of the program provided for under this Act and to determine the need for additional legislation.

(b) The President shall submit to the appropriate committees of the Congress each year with the Budget submitted to Congress pursuant to Section 201(a) of the Budget and Accounting Act, 1921 (31 U.S.C. 11(s)), for the next fiscal year a report containing an annual materials plan for the operation of the stockpile during such fiscal year and the succeeding four fiscal years. Each such report shall include details of planned expenditures for acquisition of strategic and critical materials during such period (including expenditures to be made from appropriations from the general fund of the Treasury) and of anticipated receipts from proposed disposals of stockpile materials during such period.

## DEFINITIONS

SEC. 12. For the purposes of this Act:

(1) The term 'strategic and critical materials' means materials that (A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantities to meet such need.

(2) The term 'national emergency' means a general declaration of emergency with respect to the national defense made by the President or by the Congress.

SEC. 13. Notwithstanding any other provision of law, on and after January 1, 1972, the President may not prohibit or regulate the importation into the United States of any material determined to be strategic and critical pursuant to the provisions of this Act, if such material is the product of any foreign country or area not listed as a Communist-dominated country or area in general headnote 3(d) of the Tariff Schedules of the United States (19 U.S.C. 1202), for so long as the importation into the United States of material of that kind which is the product of such Communist-dominated countries or areas is not prohibited by any provision of law.



## APPENDIX 4

### EXECUTIVE ORDER 12155—STRATEGIC AND CRITICAL MATERIALS

*Source: The provisions of Executive Order 12155 of Sept. 10, 1979, appear at 44 FR 53071, 3 CFR, 1979 Comp., p. 426, unless otherwise noted.*

By the authority vested in me as President of the United States of America by the Strategic and Critical Materials Stock Piling Act, as amended (50 U.S.C. 98 *et seq.*), and by Section 301 of Title 3 of the United States Code, and in order to provide for the performance of certain functions previously performed by agencies pursuant to their own authority, it is hereby ordered, effective July 30, 1979, as follows:

1-101. The functions vested in the President by Section 3 of the Strategic and Critical Materials Stock Piling Act, as amended, hereinafter referred to as the Act, (50 U.S.C. 98b), are delegated to the Director of the Federal Emergency Management Agency.

1-102. The functions vested in the President by Section 6 of the Act (50 U.S.C. 98c) are delegated to the Administrator of General Services.

1-103. (a) The functions vested in the President by Section 8(a) of the Act (50 U.S.C. 98g(a)) are delegated to the Secretary of the Interior.

(b) The functions vested in the President by Section 8(b) of the Act (50 U.S.C. 98g(b)) are delegated to the Secretary of Agriculture.

1-104. The functions vested in the President by Section 10 of the Act (50 U.S.C. 98h-1) are delegated to the Administrator of General Services.

1-105. The functions vested in the President by Section 11 of the Act (50 U.S.C. 98h-2) are delegated to the Director of the Federal Emergency Management Agency. The Secretaries of the Interior and of Agriculture and the Administrator of General Services shall submit biannually a written report to the Director. The report shall detail their performance of functions under the Act and this Order.

1-106

*[Sec. 1-106 amends EO 12148 of July 20, 1979, this chapter, p. 806. The amendments have been incorporated into that order.]*

1-107. The functions vested in the President by Section 5(a)(2) of the Act, as amended (50 U.S.C. 98d), are delegated to the Director of the Federal Emergency Management Agency.

*[Sec. 1-107 added by EO 12417 of May 2, 1983, 48 FR 20035, 3 CFR, 1983 Comp., p. 186.]*



## APPENDIX 5

### THE WHITE HOUSE Office of the Press Secretary

For Immediate Release

July 8, 1985

#### NATIONAL DEFENSE STOCKPILE POLICY

##### BACKGROUND

The President has decided to propose a modernization of the National Defense Stockpile of strategic materials. This proposal comes after 2 years of interagency study and thousands of hours of review at the staff and policy levels at twelve different agencies. The Administration intends to consult and work with the Congress on this important national security program before the new stockpile goals are transmitted.

The National Defense Stockpile is a reserve of non-fuel materials that the United States would require in a conflict, but that might not be available in sufficient quantities from domestic or reliable foreign sources. The previous Administration in 1979 calculated the United States' stockpile needs to be \$16.3 billion for 62 materials using May 1985 prices. Toward this goal, the stockpile contains \$6.6 billion in materials. The USG possesses an additional \$3.5 billion of materials that are surplus to our requirements under the 1979 goals. Thus, unmet materials needs are \$9.7 billion under the 1979 goals.

The President's April 5, 1982, "National Materials and Minerals Program Plan and Report to Congress" announced "a major interdepartmental effort to improve the Nation's preparedness for national mobilization." Part of the review was to address the potential national security impacts of shortages of strategic and critical materials. The review covered the 42 most significant materials in the stockpile. The remaining materials will be reviewed at a later date.

The key elements of the Nation's stockpile policy are as follows:

—The National Defense Stockpile will be sufficient to meet the military, industrial and essential

civilian needs for a 3-year conventional global military conflict, as mandated by Congress in 1979.

—The conflict scenario used is to be consistent with the scenarios developed by DOD.

—The stockpile should reflect detailed analyses regarding the conflict period: essential civilian, industrial and defense mobilization requirements, foreign trade patterns, shipping losses, petroleum availability, and foreign and domestic demand and production levels for the materials in question.

##### POLICY DECISIONS

On the basis of the new stockpile study of materials requirements and supplies during a protracted military conflict, the President has decided that the stockpile for the 42 materials studied will now contain \$6.7 billion in materials and include two tiers.

Goals of \$.7 billion (Tier I) are proposed for materials that would be required during a protracted military conflict that would not be available in sufficient quantities from domestic or reliable foreign sources. The stockpile also will contain a Supplemental Reserve of strategic and critical materials currently valued at \$6 billion (Tier II). The Supplemental Reserve will contain materials that the USG already possesses. This reserve will offer additional assurance against materials shortages during a period of military conflict. Both Tiers of stockpile provide over one year's peacetime levels of imports for such materials as chromium, manganese, cobalt and tantalum. These new stockpile goals will eliminate the \$9.7 billion unmet goal.

The new stockpile will result in surplus materials of \$3.2 billion, as opposed to the \$3.5 billion surplus calculated by the previous Administration. The mix of materials considered to be surplus, however, is different.

The President has decided to sell a portion (\$2.5 billion out of \$3.2 billion) of the surplus materials stocks in a manner—over the next five years—that minimizes market impacts. An interagency group will evaluate ways to ensure that stockpile sales do no cause undue market disruptions.

Receipts from the sales program will go to fill unmet materials goals under the 1984 study, including any goals that may result from analyses of the twenty materials yet to be studied, including any new, high-technology materials; the remainder will go to reduce the deficit. The stockpile goals planning assumptions also will be used for other appropriate mobilization preparedness areas.

## **STUDY PROCESS**

The 1984 stockpile study completed by the Administration included a review of the analysis,

methods and assumptions used by the previous Administration in the 1979 study. This review concluded that a number of basic errors and unrealistic assumptions were used in the 1979 study. The present study relied on more realistic assumptions regarding oil availability, essential civilian requirements and domestic materials production. The new stockpile, unlike the one proposed in 1979, does not reflect the stockpiling of materials to ensure non-essential consumer production in a protracted military conflict. The stockpile does reflect essential civilian goods production with per capita consumption at more than twice the WW II level.

In the 1984 study, substantial improvements were made in analytic methods for estimating material requirements and available supply. These changes, the correction of errors and the use of more plausible assumptions, are the primary reasons for the revised goals. The 1984 study was started in 1983 and relied on actual data up to and including 1982 for all phases of the analysis. In all areas, the latest, best available data was used. By contrast, the previous 1979 stockpile goals relied on 1967 data in many cases.

# STOCKPILE GOALS\*

Commodity	Goal (\$M)	Quantities
Beryllium Concentrate		
Antimony	\$ 12.6	4,585 ST
Bauxite		
Bauxite, Refractory Grade		
Bauxite, Abrasive Grade		
Bismuth		
Cadmium		
Chromium	84.9	200 TH ST
Cobalt	245.0	22.57 M lbs.
Columblum		
Copper		
Diamond, Industrial, Stones		
Fluorspar		
Germanium	154.8	146,049.4 kg
Graphite, Ceylon	9.9	5,085.5 ST
Graphite, Malagasy	42.0	13,995.9 ST
Graphite, Other	1.6	2,237.1 ST
Iodine		
Lead		
Manganese		
Mercury (Mlne)		
Mica, Muscovite Block	1.3	246.4 TH lbs.
Mica, Muscovite Flim	0.2	18.7 TH lbs.
Mica, Muscovite Split	21.6	14,391.1 TH lbs.
Mica, Phlogopite Block	0.5	85.0 TH lbs.
Mica, Phlogopite Split	1.0	482.6 TH lbs.
Molybdenum		
Nickel		
Platinum Group, Iridium		
Platinum Group, Palladium		
Platinum Group, Platinum		
Quartz Crystal, Natural	0.2	28.5 TH lbs.
Rubber		
Rutile		
Silicon Carbide		
Silver		
Tantalum	72.1	1,900.7 TH lbs.
Tin		
Titanium	43.3	3.9 TH ST
Tungsten		
Vanadium		
Zinc		
	\$691.0	

\*Goal value based on May 31, 1985, market prices.

# SUPPLEMENTAL RESERVE

Commodity	Value (\$M)*	Quantities
Aluminum Oxide, Abrasive Grain Group	65	208,139 ST Ab Grain Eq.
Bauxite	828	4,278,912 ST Al Metal Eq.
Bauxite, Refractory Grade	52	274,926 LCT
Beryllium	164	437 ST Be Metal Eq.
Chromite, Refractory Grade	18	180,000 SDT
Chromium	756	594,123 ST Cr Metal Eq.
Cobalt	65	6 million Lbs Co
Columblum	19	2,532,419 lb Cb Metal Eq.
Copper	46	29,048 ST
Diamonds, Industrial Stones	205	7,950,000 KT
Graphite, Ceylon (415 ST)	1	415 ST
Iodine	31	5.5 million Lbs
Lead	123	300,000 ST
Manganese	369	869,667 ST Mn Metal Eq.
Mica, Muscovite Block	1	200,000 Lbs
Quartz, Crystals	11	1.8 million Lbs
Electrolytic Nickel	24	5,000 ST
Rubber	116	127,455 MT
Silver	543	87,500,000 Tr Oz
Tantalum	84	1,023,320 lbs Ta Metal Eq.
Tin	1,814	150,000 MT
Titanium	233	21.1 TH ST
Tungsten	298	52,215,245 Lb W Metal Eq.
Vanadium	8	722 ST V Metal
Zinc	81	85,000 ST
	\$5,955	

\*Value based on May 31, 1985 prices.

## APPENDIX 6



United States  
General Accounting Office  
Washington, D.C. 20548

National Security and  
International Affairs Division

B-223657

August 4, 1986

The Honorable James A. McClure  
Chairman, Committee on Energy  
and Natural Resources  
United States Senate

The Honorable Charles E. Bennett  
Chairman, Subcommittee on Seapower and  
Strategic and Critical Materials  
Committee on Armed Services  
House of Representatives

In July 1985, you asked us to evaluate the National Security Council's (NSC's) study of national defense stockpile goals, the results of which were announced on July 8, 1985, and to obtain participating agencies' views on the study. In subsequent discussions with your office, we were asked to provide this interim briefing report assessing whether the NSC stockpile study is a sufficient basis for U.S. mobilization planning, including the proposed changes in national defense stockpile goals.

Materials, such as cobalt and titanium, are stockpiled to meet increased defense demands expected at the beginning of a wartime mobilization. Which materials, and the amounts to be stockpiled, can vary significantly depending on the assumptions used. Assumptions need to be made about issues such as the anticipated defense demand, the capability of U.S. industry to surge to meet demand, sacrifices in consumer-goods production to reallocate resources to mobilization needs, and the availability of materials from foreign sources in times of conflict.

Because of the assumptions it used, the NSC study recommended a stockpile goal of \$0.7 billion, which is much lower than the previous goal of \$16.1 billion, established based on a 1979 study. Of \$10.1 billion in stockpile inventory on hand against the previous \$16.1 billion goal, the NSC study recommended selling \$3.2 billion and holding a \$6 billion supplemental reserve, at least temporarily, of materials already on hand.

Our preliminary assessment is that the NSC study does not appear to provide a sufficient basis for setting stockpile goals or for other U.S. mobilization planning. Although the NSC study methodology was similar to the methods of past studies and made some improvements, the assumptions used were very different, and the study report did not adequately reflect major disagreements among study participants with regard to key assumptions. Furthermore, the study did not adequately show that its results could vary greatly with changes in its assumptions. Such ranges of results, which can be quantified by doing sensitivity tests on the assumptions used, were a key part of the prior study, and provided decision makers a basis by which to assess the study's conclusions.

We caution that this preliminary assessment is based on a partial analysis of unclassified material. In our ongoing evaluation of the NSC stockpile study, we are reviewing the stockpile study report and supporting classified documentation, examining past stockpile studies and critiques of those studies, and discussing stockpile issues with representatives of each of the agencies that participated in the NSC study. We are also obtaining the views of outside experts. In our remaining work, one of the key steps is to determine which of NSC's assumptions have the most impact on the level of the stockpile. In order to accomplish this task, sensitivity tests need to be conducted for each assumption.

#### MAJOR QUESTIONS ARISING IN OUR EVALUATION OF THE NSC STOCKPILE STUDY

Although our work is not complete, it raises questions about whether the NSC study adequately supports its recommendations to (1) significantly reduce stockpile-goal levels and (2) use the study's planning assumptions for other mobilization-preparedness areas. Specific questions include whether NSC study assumptions are consistent with defense planning assumptions and data, with past U.S. economic experience and economic projections by other groups, and with estimates of supply and demand by industry and other experts.

Study participants and industry and economic experts have expressed serious concerns about study assumptions, methodology, and results. For example, key study participants said that they did not agree with NSC's assumptions, and that the NSC study did not adequately show the impact of alternative assumptions. Our initial tests confirmed this, and showed that stockpile-goal levels can vary widely as assumptions change.

The NSC study group initially computed a stockpile goal of \$230 million. NSC then modified assumptions by making adjustments to increase material requirements for the defense and industrial sectors and reduce world supply, which increased the goal to \$691 million. However, NSC's adjustments were limited. For example, study participants reported that no changes were considered for such factors as oil availability and essential civilian requirements. Also, the reported adjustments for such assumptions as defense-sector requirements covered only part of the assumptions' plausible ranges.

We believe that analyses on several additional assumptions are needed, which could provide the basis for decision makers to choose a different goal than the

\$691 million NSC proposed. The analyses would involve key assumptions, such as for defense expenditures, nonresidential investment in equipment, the degree of civilian austerity, availability of oil, wartime production capabilities of the critical materials mining and processing industries, and the availability of critical materials imports to the United States.

Plausible changes in many of the study's assumptions could cause computer stockpile goals to vary widely. For example, outside experts have suggested that, in a major conventional war, the U.S. wartime economy and associated defense expenditures could far exceed the levels assumed in the NSC study. If the increased expenditures caused a 50-percent increase in material requirements for the defense sector, this one change alone could cause the overall stockpile goal to increase to almost \$1 billion—well beyond the \$691 million proposed by the NSC study. As another example, NSC's study places much greater reliance on foreign sources of supply than was done in prior stockpile studies, or was recommended by some study participants. The impact of these kinds of assumption changes needs to be clearly identified through additional analyses.

## BASIS FOR INTERIM STOCKPILE PURCHASES OR DISPOSALS

While we believe that final congressional action on approving a stockpile goal should not be made until we have completed our evaluation, and the Administration has responded to our findings, there appear to be some low risk interim actions that can be taken based on areas where the NSC and 1979 studies are in agreement.

Both the NSC study and a 1979 interagency study, coordinated by the Federal Emergency Management Agency, agree that about \$3.4 billion worth of materials on hand are excess to national security needs, and could be sold or bartered. On the other hand, the current inventory of at least one material—germanium—falls short of both its current and NSC-proposed goals. Furthermore, material experts among the study participants and advisory committees say that some materials being stockpiled, such as cobalt, may need to be upgraded. Your Committees may wish to discuss with one or more of these organizations, such as the National Materials Advisory Council or the General Services Administration, the desirability of using proceeds from future disposal sales, or moneys already in the National Defense Stockpile Transaction Fund, to upgrade such materials.

\* \* \* \* \*

We discussed our preliminary results with NSC and Office of Management and Budget (OMB) officials who coordinated the NSC study. They told us that stockpile goals were driven primarily by defense planning assumptions, and that they believed the NSC study's assumptions to be consistent with defense planning. A detailed discussion would involve classified information; however, we can point out that the defense guidance addresses a likely range of wartime effort including levels greater than assumed by NSC. Also, unlike the NSC study, which accepts increased reliance on foreign sources of material supply, the defense guidance indicates that a growing reliance on foreign sources poses a threat to national security.

Analyses of different assumptions than those used in NSC's proposed \$691 million stockpile goal would, in our opinion, show a much broader range of stockpile goal options. Differing assumptions for a variety of factors have been suggested by top study participants and other experts. In response to our request for further analyses of defense and other assumptions, NSC and OMB officials said that they would consider analyzing key assumptions on a case-by-case basis, but they have not yet begun such analyses.

We are sending copies of this briefing report to the Chairmen, Senate and House Committees on Armed Services, the Senate and House Committees on Appropriations, the Senate Committee on Governmental Affairs, and the House Committee on Government Operations; to the Assistant to the President for National Security Affairs; and to the heads of the 12 agencies which participated in the NSC study. Copies will be made available to other interested parties upon request.

If you have any questions, please call Martin M. Ferber, Associate Director for Manpower, Reserve Affairs, and Logistics, at 275-4001.

Frank C. Conahan  
Director

NATIONAL SECURITY COUNCIL  
WASHINGTON, D.C. 20505

September 20, 1986

MEMORANDUM FOR MR. FRANK C. CONAHAN  
Director, National Security and  
International Affairs Division  
General Accounting Office

SUBJECT: GAO Interim Report

A review of the GAO interim report on the 1984 NSC Stockpile Study has been completed in consultation with appropriate agency working group chairmen. Our assessment of the report is that it contains a number of incorrect claims; relies heavily on unsupported claims or theories of individuals referred to as key study participants and outside experts; and lacks sufficient analysis to support the overall conclusion that the NSC study is inadequate for mobilization planning purposes.

Summarized in the attached is a critique of each major GAO finding in the interim report. A careful review of these critiques will provide the reasons why we believe that the interim report conclusions are not justified or supported. It is recognized that the GAO did not have access to data provided during the past month in compiling the interim report. Therefore, we strongly urge the GAO to again thoroughly review all provided materials, ensure complete understanding of the methodology of the NSC study and carefully review and compare the 1979 study documentation prior to issuance of a final report. Additionally, a final report should recognize two things about the NSC study that were not mentioned in the interim report.

First, the 1984 study corrects a number of basic shortcomings in the 1979 study including a flawed assumption about petroleum availability that the GAO criticized in its assessment of the 1979 study. Secondly, the 1984 study uses more vigorous assumptions about the size of the Defense buildup than the 1979 study and in World War II, which resulted in increased material requirements.

It is our intent to work with the GAO and make every effort to provide you with any additional technical data and expertise in completing your review and preparing an accurate final report.

Rodney B. McDaniel  
Executive Secretary

Attachment  
Critique



## APPENDIX 7

Apr. 24, 1986

The Honorable Charles E. Bennett  
Chairman, Subcommittee on Seapower and  
Strategic and Critical Materials  
Committee on Armed Services  
House of Representatives  
Washington, D.C. 20515

Dear Mr. Bennett:

This is in response to your letter of February 28, 1986, regarding the Fiscal Year (FY) 1987 Annual Materials Plan (AMP) for the National Defense Stockpile. You requested resubmission of the Plan to reflect existing law and currently approved stockpile goals as well as data on plans for the 4 succeeding years.

Enclosed is a schedule which separately identifies those materials in the FY 1987 AMP that are (1) currently authorized for disposal under existing goals, (2) require new disposal authority, and (3) require statutory changes. Of course, we fully understand that no disposals for cash can proceed until there is a resolution to the limitation on disposals under Section 5(b) of the Strategic and Critical Materials Stock Piling Act.

The total program levels for each of the 4 succeeding years are provided in the enclosed information and are consistent with the President's FY 1987 budget. As shown there, annual acquisitions of \$30 million and annual sales of \$500 million are planned for each of the 4 succeeding years.

We are proposing purchases of germanium and other exotic defense materials for a total expenditure of \$150 million over the 5-year period. Regarding disposals, we are not in a position to provide detailed estimates of individual materials for the 4 succeeding years. Levels for such disposals will be based on then prevailing market conditions, and cannot be estimated accurately. We are very mindful of the prohibition against undue market disruption in Section 6 of the Stock Piling Act and may need to change the distribution of materials in these estimates each year.

We are in complete agreement that the National Defense Stockpile is a vital part of the defense industrial base. We hope that this additional information adequately addresses the issues raised in your letter. My staff will contact your office regarding any future meetings on areas of mutual concern.

Sincerely,

"SIGNED"

Julius W. Becton, Jr.  
Director

Enclosures

## **Suggested Format for FY 1987 Annual Materials Plan (AMP) Revision**

The chart shows a suggested format for revision of the FY 1987 AMP incorporating the comments of Congressman Bennett in his letter of February 28, 1986, and including the Office of Management and Budget/National Security Council approved control totals.

The materials have been separated into three groups, as follows:

1. Group I - Materials having surplus under present goals and existing disposal authority.
2. Group II - Materials having surplus under present goals but no existing disposal authority.
3. Group III - Materials having surplus under proposed goals and requiring new goals and new disposal authority.

Actual values have been shown for the FY 1987 list and existing disposal authority has been allocated across the coming fiscal years to indicate when new authority would be needed.

Disposal quantities for the outyears have been set at a Maximum Market Impact quantity (MMI) to realize the maximum receipts in order to meet the \$500 million total shown in the President's budget projections.

The following chart represents a sample of how the 5-year AMP would appear. The actual values beyond FY 1987 would be provided through the Interagency AMP Steering Committee.

		1987		1988		1989		1990		1991	
Group I		Q	V	Q	V	Q	V	Q	V	Q	V
Material - Unit		(000)	(\$M)	(000)	(\$M)	(000)	(\$M)	(000)	(\$M)	(000)	(\$M)
Antimony	ST	1.5	3.9	*MMI		MMI		MMI		MMI	
Ind. Diamond	KT	1500.0	39.8	MMI		MMI		MMI		MMI	
MnO2 Bal. Gr.	SDT	2.5	0.2	MMI		MMI		MMI		MMI	
Man. Ore. Met.	SDT	50.0	3.1	MMI		MMI		MMI		MMI	
Mica, M.F.	LB	3.0	0.01	MMI		MMI		MMI		MMI	
Silver (Sales)	TR.OZ	4400.0	25.9	*MMI		MMI		MMI		MMI	
Silver (Coins)	TR.OZ	3000.0	17.7	MMI		MMI		MMI		MMI	
Tin	MT	4.0	35.3	MMI		MMI		MMI		MMI	
Tungsten	LB	700.0	2.3	*MMI		MMI		MMI		MMI	
Thorium Nitrate	LB	10.0	0.03	MMI		MMI		MMI		MMI	
VTE Chestnut	LT	1.0	0.7	MMI		MMI		MMI		MMI	
VTE Quebracho	LT	4.0	2.7	MMI		MMI		MMI		MMI	
Subtotal			131.628								
Group II		Q	V	Q	V	Q	V	Q	V	Q	V
Material - Unit		(000)	(\$M)	(000)	(\$M)	(000)	(\$M)	(000)	(\$M)	(000)	(\$M)
Iodine	LB	* 800.0	5.1	MMI		MMI		MMI		MMI	
Mercury	FL	* 3.7	1.1	MMI		MMI		MMI		MMI	
Mica, M.S.	LB	* 262.0	.08	MMI		MMI		MMI		MMI	
Mica, P.S.	LB	* 100.0	.08	MMI		MMI		MMI		MMI	
Quartz Crystals	LB	* 100.0	.60	MMI		MMI		MMI		MMI	
Sapphire & Ruby	KT	*	.10	MMI		MMI		MMI		MMI	
Silicon Carbide	ST	* 7.6	3.4	MMI		MMI		MMI		MMI	
Tungsten	LB	* 200.0	3.96	MMI		MMI		MMI		MMI	
Subtotal			14.4								

\* New Authority Needed at this Point.

			1987		1988		1989		1990		1991	
Group III			Q	V	Q	V	Q	V	Q	V	Q	V
Material - Unit			(000)	(\$M)	(000)	(\$M)	(000)	(\$M)	(000)	(\$M)	(000)	(\$M)
Aluminum Oxide, AG	ST		7.6	9.5	MMI		MMI		MMI		MMI	
BCMA	ST		0.08	1.0	MMI		MMI		MMI		MMI	
Bismuth	LB		135.0	0.6	MMI		MMI		MMI		MMI	
Cadmium	LB		255.0	0.2	MMI		MMI		MMI		MMI	
Chrome Ore, Chem.	SDT		7.5	0.4	MMI		MMI		MMI		MMI	
Chrome Ore, Mat.	SDT		50.0	8.5	MMI		MMI		MMI		MMI	
FeCoSi	ST		2.0	1.7	MMI		MMI		MMI		MMI	
Chrome Ore, Ref.	SDT		6.0	0.6	MMI		MMI		MMI		MMI	
Cobalt	LB		573.0	9.6	MMI		MMI		MMI		MMI	
Diamond, Bort	KT		2000.0	2.5	MMI		MMI		MMI		MMI	
Fluorspar, Mat.	SDT		45.0	5.6	MMI		MMI		MMI		MMI	
Fluorspar, Acid	SDT		30.0	5.2	MMI		MMI		MMI		MMI	
Graphite, Malagasy												
Flakes	ST		1.0	3.0	MMI		MMI		MMI		MMI	
Lead	ST		40.0	15.2	MMI		MMI		MMI		MMI	
MNO2 Syn.	SDT		0.5	0.3	MMI		MMI		MMI		MMI	
MN Metal, Elec.	ST		1.0	1.6	MMI		MMI		MMI		MMI	
Mica, M.B.	LB		100.0	0.1	MMI		MMI		MMI		MMI	
Mica, M.F.	LB		3.0									
Mica, P.B.	LB		10.0									
Nickel	ST		5.0	16.0	MMI		MMI		MMI		MMI	
Platinum	TR.OZ		43.5	14.6	MMI		MMI		MMI		MMI	
Palladium	TR.OZ		52.5	5.2	MMI		MMI		MMI		MMI	
Iridium	TR.OZ		1.7	0.7	MMI		MMI		MMI		MMI	
Rutile	SDT		10.3	3.4	MMI		MMI		MMI		MMI	
VTE Wattle	LT		3.0	2.1	MMI		MMI		MMI		MMI	
Titanium, S.G.	ST		0.9	10.3	MMI		MMI		MMI		MMI	
Titanium, NSG	ST		0.9	9.0	MMI		MMI		MMI		MMI	
Zinc	ST		45.0	31.6	MMI		MMI		MMI		MMI	
Subtotal				156.9								
Grand Total			302.9		\$500.0		\$500.0		\$500.0		\$500.0	

## APPENDIX 8

### STRATEGIC AND CRITICAL MATERIALS STOCK PILING ACT (As amended by the National Defense Authorization Act of 1987) (50 U.S.C. 98 *et seq.*)

SEC. 1. This Act may be cited as the "Strategic and Critical Materials Stock Piling Act."

#### FINDINGS AND PURPOSE

SEC. 2. (a) The Congress finds that the natural resources of the United States in certain strategic and critical materials are deficient or insufficiently developed to supply the military, industrial, and essential civilian needs of the United States for national defense.

(b) It is the purpose of this Act to provide for the acquisition and retention of stocks of certain strategic and critical materials and to encourage the conservation and development of sources of such materials within the United States and thereby to decrease and to preclude, when possible, a dangerous and costly dependence by the United States upon foreign sources for supplies of such materials in times of national emergency.

#### MATERIALS TO BE ACQUIRED: PRESIDENTIAL AUTHORITY AND GUIDELINES

SEC. 3. (a) The President shall determine from time to time (1) which materials are strategic and critical materials for the purposes of this Act, and (2) the quality and quantity of each such material to be acquired for the purposes of this Act and the form in which each such material shall be acquired and stored. Such materials when acquired, together with the other materials described in section 4 of this Act, shall constitute and be collectively known as the National Defense Stockpile (hereinafter in this Act referred to as the "stockpile").

(b) The President shall make the determinations required to be made under subsection (a) on the basis of the following principles:

(1) The purpose of the stockpile is to serve the interest of national defense only and is not to be used for economic or budgetary purposes.

(2) The quantities of the materials stockpiled should be sufficient to sustain the United States for a period of not less than three years in the event of a national emergency.

(c) The quantity of any material to be stockpiled under this Act, as determined under subsection (a), may not be revised unless the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed revision and the reasons for such revision at least 30 days before the effective date of such revision.

#### MATERIALS CONSTITUTING THE NATIONAL DEFENSE STOCKPILE

SEC. 4. (a) The stockpile consists of the following materials:

(1) Materials acquired under this Act and contained in the national stockpile on July 29, 1979.

(2) Materials acquired under this Act after July 29, 1979.

(3) Materials in the supplemental stockpile established by section 104(b) of the Agricultural Trade Development and Assistance Act of 1954 (as in effect from September 21, 1959, through December 31, 1966) on July 29, 1979.

(4) Materials acquired by the United States under the provisions of section 303 of the Defense Production Act of 1950 (50 U.S.C. App. 2093) and transferred to the stockpile by the President pursuant to subsection (f) of such section.

(5) Materials transferred to the United States under section 663 of the Foreign Assistance Act of 1961 (22 U.S.C. 2423) that have been determined to be strategic and critical materials for the purposes of this Act and that are allocated by the President under subsection (b) of such section for stockpiling in the stockpile.

(6) Materials acquired by the Commodity

Credit Corporation and transferred to the stockpile under section 4(h) of the Commodity Credit Corporation Charter Act (15 U.S.C. 714b(h)).

(7) Materials acquired by the Commodity Credit Corporation under paragraph (2) of section 103(a) of the Act entitled "An Act to provide for greater stability in agriculture; to augment the marketing and disposal of agricultural products; and for other purposes", approved August 28, 1954 (7 U.S.C. 1743(a)), and transferred to the stockpile under the third sentence of such section.

(8) Materials transferred to the stockpile by the President under paragraph (4) of section 103(a) of such Act of August 28, 1954.

(9) Materials transferred to the stockpile under subsection (h).

(b) Notwithstanding any other provisions of law, any material that (1) is under the control of any department or agency of the United States, (2) is determined by the head of such department or agency to be excess to its needs and responsibilities, and (3) is required for the stockpile shall be transferred to the stockpile. Any such transfer shall be made without reimbursement to such department or agency, but all costs required to effect such transfer shall be paid or reimbursed from funds appropriated to carry out this Act.

## AUTHORITY FOR STOCKPILE OPERATIONS

SEC. 5. (a) (1) Except for acquisitions made under the authority of paragraph (3) or (4) of Section 6(a), no funds may be obligated or appropriated for acquisition of any material under this Act unless funds for such acquisition have been authorized by law. Funds appropriated for such acquisition (and for transportation and other incidental expenses related to such acquisition) shall remain available until expended, unless otherwise provided in appropriation Acts.

(2) If for any fiscal year the President proposes certain stockpile transactions in the annual

no amount may be obligated or expended for such transaction during such year until the President has submitted a full statement of the proposed transaction to the appropriate committees of Congress and a period of 30 days has passed from the date of the receipt of such statement by such committees or until each such committee, before the expiration of such period, notifies the President that it has no objection to the proposed transaction. In computing any 30-day period for the purpose of the preceding sentence, there shall be excluded any day on which either House of Congress is not in session because of an adjournment of more than three days to a day certain.

(b) Except for disposals made under the authority of paragraph (3), (4), or (5) of section 6(a) or under section 7(a), no disposal may be made from the stockpile (1) unless such disposal, including the quantity of the material to be disposed of, has been specifically authorized by law, or (2) if the disposal would result in there being a balance in the National Defense Stockpile Transaction Fund in excess of \$250,000,000.

(c) There is authorized to be appropriated such sums as may be necessary to provide for the transportation, processing, refining, storage, security, maintenance, rotation, and disposal of materials contained in or acquired for the stockpile. Funds appropriated for such purposes shall remain available to carry out the purposes for which appropriated for a period of two fiscal years, if so provided in appropriation Acts.

## STOCKPILE MANAGEMENT

SEC. 6. (a) The President shall—

(1) acquire the materials determined under section 3(a) to be strategic and critical materials;

(2) provide for the proper storage, security, and maintenance of materials in the stockpile;

(3) provide for the refining or processing of any material in the stockpile when necessary to convert such material into a form more suitable for storage and subsequent disposition;

(4) provide for the rotation of any material in the stockpile when necessary to prevent deterioration of such material by replacement of such material with an equivalent quantity of substantially the same material;

(5) subject to the notification required by subsection (d)(2), provide for the timely disposal of materials in the stockpile that (A) are excess to stockpile requirements, and (B) may cause a loss to the Government if allowed to deteriorate; and

(6) subject to the provisions of section 5(b), dispose of materials in the stockpile the disposal of which is specifically authorized by law.

(b) Except as provided in subsections (c) and (d), acquisition of strategic and critical materials under this Act shall be made in accordance with established Federal procurement practices, and, except as provided in subsections (c) and (d) and in section 7(a), disposal of materials from the stockpile shall be made by formal advertising or competitive negotiation procedures. To the maximum extent feasible—

(1) competitive procedures shall be used in the acquisition and disposal of such materials;

(2) efforts shall be made in the acquisition and disposal of such materials to avoid undue disruption of the usual markets of producers, processors, and consumers of such materials and to protect the United States against avoidable loss; and

(3) disposal of such materials shall be made for domestic consumption.

(c)(1) the President shall encourage the use of barter in the acquisition of strategic and critical materials for, and the disposal of materials from, the stockpile when acquisition or disposal by barter is authorized by law and is practical and in the best interest of the United States.

(2) Materials in the stockpile, the disposition of which is authorized by law, shall be available for transfer at fair market value as payment for expenses (including transportation and other incidental expenses) of acquisition of materials, or of refining, processing, or rotating materials, under this Act.

(3) To the extent otherwise authorized by law, property owned by the United States may be bartered for materials needed for the stockpile.

(d)(1) The President may waive the applicability of any provision of the first sentence of subsection (b) to any acquisition of material for, or disposal of material from, the stockpile. Whenever the President waives any such provision with

respect to any such acquisition or disposal, or whenever the President determines that the application of paragraph (1), (2), or (3) of such subsection to a particular acquisition or disposal is not feasible, the President shall notify the Committees on Armed Services of the Senate and House of Representatives in writing of the proposed acquisition or disposal at least thirty days before any obligation of the United States is incurred in connection with such acquisition or disposal and shall include in such notification the reasons for not complying with any provision of such subsection.

(2) Materials in the stockpile may be disposed of under subsection (a)(5) only if the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed disposal at least thirty days before any obligation of the United States is incurred in connection with such disposal.

(c) The President may acquire leasehold interests in property, for periods not in excess of ten years, for storage, security, and maintenance materials in the stockpile.

## NATIONAL DEFENSE STOCKPILE MANAGER

SEC. 6A. (a) The President shall designate a single Federal official to perform the functions the President under this Act. The official designated shall be an officer who holds a civil position to which the person was appointed by the President, by and with the advice and consent of the Senate.

(b) The officer designated by the President under this section shall be known for purposes of his functions under this Act as the "National Defense Stockpile Manager."

## SPECIAL DISPOSAL AUTHORITY OF THE PRESIDENT

SEC. 7. (a) Materials in the stockpile may be released for use, sale, or other disposition—

(1) on the order of the President, at any time the President determines the release of such materials is required for purposes of the national defense; and

(2) in time of war declared by the Congress or during a national emergency, on the order of

any officer or employee of the United States designated by the President to have authority to issue disposal orders under this subsection, if such officer or employee determines that the release of such materials is required for purposes of the national defense.

(b) Any order issued under subsection (a) shall be promptly reported by the President, or by the officer or employee issuing such order, in writing, to the Committees on Armed Services of the Senate and House of Representatives.

## MATERIALS DEVELOPMENT AND RESEARCH

SEC. 8. (a)(1) The President shall make scientific, technologic, and economic investigations concerning the development, mining, preparation, treatment, and utilization of ores and other mineral substances that (A) are found in the United States, or in its territories or possessions, (B) are essential to the national defense, industrial, and essential civilian needs of the United States, and (C) are found in known domestic sources in inadequate quantities or grades.

(2) Such investigations shall be carried out in order to—

(A) determine and develop new domestic sources of supply of such ores and mineral substances;

(B) devise new methods for the treatment and utilization of lower grade reserves of such ores and mineral substances; and

(C) develop substitutes for such essential ores and mineral products.

(3) Investigations under paragraph (1) may be carried out on public lands and, with the consent of the owner, on privately owned lands for the purpose of exploring and determining the extent and quality of deposits of such minerals, the most suitable methods of mining and beneficiating such minerals, and the cost at which the minerals or metals may be produced.

(b) The President shall make scientific, technologic, and economic investigations of the feasibility of developing domestic sources of supplies of any agricultural material or for using agricultural commodities for the manufacture of any material determined pursuant to section 3(a)

of this Act to be a strategic and critical material or substitutes therefor.

## NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

SEC. 9. (a) There is established in the Treasury of the United States a separate fund to be known as the National Defense Stockpile Transaction Fund (hereinafter in this section referred to as the "fund").

(b) (1) All moneys received from the sale of materials in the stockpile under paragraphs (5) and (6) of section 6(a) shall be covered into the fund.

(2) Subject to section 5(a)(1), moneys covered into the fund under paragraph (1) are hereby made available (subject to such limitations as may be provided in appropriation Acts) for the following purposes:

(A) The acquisition of strategic and critical materials under section 6(a)(1).

(B) Transportation, storage, and other incidental expenses related to such acquisition.

(C) Development of current specifications of stockpile materials and the upgrading of existing stockpile materials to meet current specifications (including transportation, when economical, related to such upgrading).

(D) Testing and quality studies of stockpile materials.

(E) Studying future material and mobilization requirements for the stockpile.

(F) Other reasonable requirements for management of the stockpile.

(3) Moneys in the fund shall remain available until expended.

(c) All moneys received from the sale of materials being rotated under the provisions of section 6(a)(4) or disposed of under section 7(a) shall be covered into the fund and shall be available only for the acquisition of replacement materials.

## ADVISORY COMMITTEES

SEC. 10. (a) The President may appoint advisory committees composed of individuals with expertise relating to materials in the stockpile or with ex-

rtise in stockpile management to advise the President with respect to the acquisition, transportation, processing, refining, storage, security, maintenance, tation, and disposal of such materials under this Act.

(b) Each member of an advisory committee established under subsection (a) while serving on the business of the advisory committee away from the member's home or regular place of business shall be allowed travel expenses, including per diem lieu of subsistence, as authorized by section 5703 title 5, United States Code, for persons intermittently employed in the Government service.

## REPORTS TO CONGRESS

SEC. 11. (a) The President shall submit to the Congress every six months a written report detailing operations under this Act. Each such report shall include—

(1) information with respect to foreign and domestic purchases of materials during the preceding 6-month period;

(2) information with respect to the acquisition and disposal of materials under this Act by barter, as provided for in section 6(c) of this Act, during such period;

(3) a statement and explanation of the financial status of the National Defense Stockpile Transaction Fund and the anticipated appropriations to be made from the fund during the next fiscal year; and

(4) such other pertinent information on the administration of this Act as will enable the Congress to evaluate the effectiveness of the program provided for under this Act and to determine the need for additional legislation.

(b) The President shall submit to the appropriate committees of the Congress each year, the time that the Budget is submitted to Congress pursuant to section 1105 of title 31, United

States Code, for the next fiscal year, a report containing an annual materials plan for the operation of the stockpile during such fiscal year and the succeeding four fiscal years. Each such report shall include details of planned expenditures for acquisition of strategic and critical materials during such period (including expenditures to be made from appropriations from the general fund of the Treasury) and of anticipated receipts from proposed disposals of stockpile materials during such period.

## DEFINITIONS

SEC. 12. For the purposes of this Act:

(1) The term "strategic and critical materials" means materials that (A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantities to meet such need.

(2) The term "national emergency" means a general declaration of emergency with respect to the national defense made by the President or by the Congress.

SEC. 13. Notwithstanding any other provision of law, on or after January 1, 1972, the President may not prohibit or regulate the importation into the United States of any material determined to be strategic and critical pursuant to the provisions of this Act, if such material is the product of any foreign country or area not listed as a Communist-dominated country or area in general headnote 3(d) of the Tariff Schedules of the United States (19 U.S.C. 1202), for so long as the importation into the United States of material of that kind which is the product of such Communist-dominated countries or areas is not prohibited by any provision of law.